(25,458)

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1916.

No. 628.

JIM BUTLER TONOPAH MINING COMPANY, PLAINTIFF IN ERROR,

vs.

WEST END CONSOLIDATED MINING COMPANY.

IN ERROR TO THE SUPREME COURT OF THE STATE OF NEVADA.

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a In the Supreme Court of the State of Nevada.

No. —.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff and Appellant,

vs.

WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant and Respondent.

RECORD ON APPEAL.

b In the District Court of the Fifth Judicial District of the State of Nevada in and for Nye County.

No. 2999.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,

vs.

WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Bill of Exceptions and Record on Appeal.

(Volume I.)

Be it remembered that on the seventh day of December, 1914, the above-entitled cause came on for trial, and a jury being waived and the respective parties having agreed to submit the said cause to the Court for determination without the intervention of a jury, the parties then and there entered into and filed a stipulation governing the order of the trial, and other matters therein set forth, which said stipulation is as follows, to-wit:

c In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

No. 2999.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,

vs.

WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Stipulation.

It is stipulated and agreed between the parties hereto as follows:

I.

That the motion of Plaintiff heretofore made to file an amendment to its complaint, amending Paragraph VII of said complaint and

Paragraph 3 of the Prayer of said complaint may be granted and said amendments or an engrossed amended complaint embodying said amendments may be filed as of the date of this stipulation:—that the answer of the Defendant to the original complaint shall be deemed and taken as the Answer to the amended complaint and the replication heretofore filed shall stand as a replication to said Answer; subject to all rights of amendments by permission of the Court.

II.

The title, ownership and right of possession to the ore bodies in dispute shall be first tried and determined by the Court before Plaintiff shall be called upon to introduce evidence as to tonnage and value of ore extracted by Defendant. The issues raised by said amended complaint, answer, and replication shall be tried in the following order:

As by said pleadings it is admitted that Defendant has been carrying on mining operations and extracting ore from underneath the surface of the Eureka and Curtis Mining Claims, owned by the Plaintiff, the Defendant shall proceed to introduce its testimony justifying its right to so mine and extract said ore. Plaintiff shall thereupon introduce its testimony in opposition to Defendant's and Defendant shall thereupon rebut the same. After the evidence has been fully taken in behalf of both parties on the issue as to title, ownership and right of possession, and argument therein had, such issue shall thereupon be submitted to the Court for its finding and decision.

III.

In the event that the Court finds in favor of Plaintiff on the issue of title, the question of the tonnage and value of the ores claimed to have been extracted by Defendant from underneath the surface of Plaintiff's mining claims and all other matters pertinent to that issue shall be brought on for hearing and trial by the Court by either party upon five days' notice one to the other. Plaintiff first introducing testimony, Defendant to follow, and Plaintiff to close with its rebuttal. In determining the tonnage and value there shall be included all such ores extracted and removed by Defendant underneath the surface of Plaintiff's mining claims prior to the commencement of this action, as may by the Court be determined to have been the property of Plaintiff, and shall also include all ore extracted and removed by Defendant from such property since the commencement of this action, which shall be adjudged to be the property of Plaintiff, and up to and including the date of the trial of such issue of tonnage and value. Upon the determination by the Court of the issue of tonnage and value, findings of fact and conclusions of law, embracing all the issues in the case, shall be signed and filed, and judgment therein shall be entered.

IV.

In the event said Court shall determine said issue of title in favor of defendant, findings of fact and conclusions of law shall be filed and judgment therein entered.

V.

Nothing in this stipulation contained shall be construed as a waiver on the part of either party of their respective rights to move to vacate or set aside any judgment which may be entered in this action, or the findings and conclusions of law made by the Court; or to apply for a new trial, or to appeal from said judgment or to take any steps in regard thereto as the respective parties may be advised.

VI.

Upon demand made in that behalf by Plaintiff, at any time subsequent to the announcement by the Court of its Decision on the issue of title, if such decision be in favor of Plaintiff, the Defendant will permit Plaintiff, its attorneys and an assistant to be nominated by Plaintiff, to inspect and take copies of all entries in the books of Defendant, relating to the tonnage and value of said ores, and to inspect and take copies of all assay sheets, memoranda of assays, maps, and other data, showing or tending to show the tonnage and value of said ores; and to give to said Plaintiff all information Defendant, its officers, and employees have in reference to said tonnage and values.

VII.

In the event said Court shall determine the issue of title in favor of said Plaintiff, and upon its announcement of such determination, the Court shall forthwith issue and set for hearing *and* order to show cause herein upon the application for a restraining order and injunction filed herein by Plaintiff on the second day of December, 1914.

Dated at Tonopah, December 7th, 1914.

CURTIS H. LINDLEY,
HUGH H. BROWN,
W. E. COLBY,
J. H. EVANS,
Attorneys for Plaintiff.
PECK, BUNKER & COLE,
HORATIO ALLING,
CHENEY, DOWNER, PRICE & HAWKINS,
DICKSON, ELLIS, ELLIS & SCHUDLER,
H. H. ATKINSON,
Attorneys for Defendant.

g [Endorsed:] No. 2999. In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye. Jim Butler Tonopah Mining Company, a Corporation, Plaintiff, vs. West End Consolidated Mining Company, a Corporation, Defendant. Stipulation. Filed Dec. 7, 1914. Robert G. Pohl, Clerk, by Lowell Daniels Deputy. Robert G. Pohl, Clerk, Nye County, Tonopah, Nevada.

h Thereafter, the trial of the case began on December eighth, 1914, the parties introducing oral and documentary evidence and sundry exhibits consisting of models, maps, diagrams, ore samples and other instruments of evidence, the trial continuing from day to day from December eighth, 1914, to and including the eighteenth day of December, 1914, upon which last-named date the taking of testimony was concluded, and the case set down for oral argument.

The evidence so adduced at said trial, taken down stenographically and thereafter reduced to long hand, together with the several exhibits referred to, is as follows:

1 In the Fifth Judicial District Court of the State of Nevada in and for the County of Nye.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Be it remembered, that the above entitled action came on regularly for trial in the said court on Tuesday, the 8th day of December, A. D. 1914, at the hour of Ten o'clock A. M. of said day before Hon. Mark R. Averill, Judge of said court sitting without a jury.

The plaintiff was represented by its attorneys, Curtis H. Lindley Esq., William Colby Esq., Hugh H. Brown Esq., and J. H. Evans Esq.

The defendant was represented by its attorneys, Messrs. Peck, Bunker & Cole, Messrs. Dickson, Ellis, Ellis & Schulder, Messrs. Cheney, Downer, Price & Hawkins, Horatio Alling Esq., and H. H. Atkinson Esq.

Thereupon, the following proceedings were had and testimony taken, to wit:

2 The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

(Both sides announce themselves ready for trial.)

Mr. Dickson: If your Honor please, under the state of the Pleadings, the burden of the proof on the issue we are about to try, namely, the question of ownership, is on the Defendant. And we have the opening of the case in the testimony, and I take it, in the argument also.

Your Honor, I have no doubt, from the number of motions on one restraining order that have come boefore the Court is familiar

with the issues in this case, but it may be not amiss for me very briefly to state the contention of the Defendant, and what we understand will be the contention on the part of the Plaintiff.

The contention on the part of the Defendant will be that in the territory in controversy there are two veins, two fissure veins, both having a course easterly and westerly; I do not mean due east and due west, but easterly and westerly course. These veins are not parellel in their course, but converge on their strike as you go to the east. They diverge in their courses downward, and converge in their course upward, until finally they intersect the south dipping vein which we will call, for convenience, the West End vein, and which our friends on the other side have a very long name for, namely, the MacNamara Tonopah Extension West End, something or other vein. We will call it the West End vein and refer to it in that way. That vein dips at an angle of from 20 to approximately, or nearly as much as 30 degrees from a horizontal. It has been followed in its downward course from what we
3 claim to be the top of the West End vein for a distance of over 750 feet.

The other vein, the north dipping vein, dips at an angle of, I should judge, about 20 degrees. I do not pretend to be exactly precise about it. The West End vein, or the south dipping vein, crosses the easterly end line of the West End claim and on its course at its apex departs from the northerly side line of the West End claim entering the MacNamara ground at a distance 1142½ feet.

Mr. Lindley: I understand the red indicates what you call the West End vein?

Mr. Dickson: The red indicates the West End vein, and the yellow indicates the MacNamara or north dipping vein. From the junction of the south dipping vein*g* and north dipping vein, the observation of our witness is that the north dipping vein continues on above the top of the south dipping vein. Not only does the fissure continue on upward, but the vein *or* quartz and the ore found in this fissure at various places—here is one just beyond—just east of the east end line of the West End claim on the Tonopah ground where we have this work driven practically on the strike, this level here (indciating) of the north dipping vein. Here we have a raise going up showing the dip of the north dipping vein there above the south dipping vein. In here we have another; the north dipping vein comes up a very considerable distance above the top of the south dipping vein. Here again for a short distance, here for a very considerable distance. Here again for some 80 feet, I should judge. Here again, here again, here again. Here again we have it going above the south dipping vein and way out we have it going up through the north dipping vein, going
4 up carrying quartz, carrying ore, not always commercial ore, at the same time we can get samples of rock in place from that rock above the top of the south dipping vein*g* carrying very considerable values.

Again, it will appear, I take it, as I understand, that at places

where we find the north dipping veing extending upward beyond the top of the south dipping vein, we find that the junction brought a change in the structure. The point of union of the two, we have the south dipping veing dipping to the south, and the north dipping vein having its dip to the north. Each of these are fissure veins. I do not mean by that that they are typical fissure veins having a sharp and well defined wall throughout and with all the ore, the full mineralization contained between the walls of the fissure, yet fissure veins in this sense, that the ore makes out from a fissure both on the north and south dipping veins into the foot wall country, impregnating replacing the foot wall country for varying distances from a few feet to 20 or 30 feet, I think, in places; the foot-wall has been replaced or impregnated, sometimes converted into merchantable ore.

That occurrence, that impregnation or replacement, so far as the hanging wall country is concerned, is, speaking generally, not found. At rare intervals and to a very limited extent has the replacement affected the hanging wall country. The hanging wall of the two veins is throughout a sharply defined, smooth, and no doubt about it when one would encounter it. Of course, as we would expect in these converging fissures, converging in their upward course, when they come to meet, to unite, and for some distance below the
5 point of claim of junction, we have what we would expect to have, the intervening foot-wall country, the two veins being soluble and such as could be acted upon by the mineralizing solutions, altered, replaced, impregnated, we have, as I say, in some places below the point of junction quartz and vein material making out from one fissure to the other fissure. Of course, as we would expect, having two fissures, uniting in that way in the quartz, at and in the vicinity, or immediately below for some distance to the point of junction, we have what we naturally expected, the intervening rock between these two is changed, giving more access to the circulation of the solutions from which these ores of either vein were deposited. On the other hand, I understand from the pleadings, from the replication of the Jim Butler Company interposed to the answer of the Defendant, the West End Company, and the answer of the Jim Butler Company filed to the Complaint in the case of the Jim Butler Company against the West End Company, involving the Fraction Claim, I infer from those answers that the contention of the other side will be that there is but one vein here and that it has no top at all. It is simply a roll, anticlinal fold. Now, as I view the law, this will still be the top or the crest of that anticlinal fold, unbroken, would be, within the meaning of the Act of Congress, the top of the vein. Goes down indefinitely from that common apex, if there were but the one vein, having an unbroken crest. Otherwise, of course, it would be a vein without any top.

Mr. Lindley: Giving you an extralateral right in both directions?

Mr. Dickson: In both directions, yes. As much so as
6 though we had two entirely separate and distinct veins. As-

sume that the end line of the claim, of our claims—our claims were parellel throughout and we had two separate and distinct veins, both crossing the end lines, the claims having separate apices, the one dipping to the south and the other dipping to the north. Our contention is we could follow both extralaterally. Both are extralateral rights being limited on both by planes drawn through the end lines extending indefinitely.

Mr. Lindley: May I ask, Judge Dickson, on whic- of the two veins is the discovery?

Mr. Dickson: On the north dipping vein.

Mr. Lindley: And then as to that, if it is assumed that is the discovery vein, the other vein is a secondary vein?

Mr. Dickson: Yes, in our views they being separate veins yes.

Mr. Lindley: After Counsel's statement as to their views of the Plaintiff in this case, we prefer to defer our statement until we open.

7 GEORGE W. PIERCE, being called and duly sworn as a witness on behalf of the defendant, testified as follows to wit:

Direct examination.

Mr. Dickson:

Q. What is your full name Mr. Pierce?
A. George W. Pierce.
Q. What is your age?
A. Fifty-one.
Q. Where do you reside?
A. In Los Angeles.
Q. What is your business?
A. Mechanical draftsman or model maker.
Q. Did you graduate at any school?
A. Why, at a normal school.
Q. What normal School?
A. Ainsworth Academy in Iowa.
Q. When did you graduate?
A. Well, in '78 or '80 I am not positive.
Q. Have you followed your profession since that time, studied it?
A. Yes, sir.
Q. You are employed by the defendant in this case, the West End Company to construct a model of the underground workings of that companie's mine, were you not?
A. Yes, sir.
Q. When were you employed,—when did you enter upon your work of constructing the model?
8 A. The 22nd. of July of this year.
Q. And how continuously have you since then been employed in the work of constructing the model?
A. Ever since.

Q. Mr. Dickson: I wish to have this model marked for identification, as defendant's exhibit One.

The Court: It will be marked Judge Dickson in due time. The

defendant's exhibits are usually marked with letters. This will be known as defendant's exhibit "A" for identification.

Mr. Dickson:

Q. Calling your attention to the model at your right, which is, or will be marked for identification as Defendant's Exhibit "A" I ask you if you constructed that model?

A. Yes, sir.

Q. From what data did you construct it?

A. From maps and drawings furnished me from the engineer's office.

Q. What Engineer?

A. The West End office.

Q. Who was the Engineer?

A. Well, Mr. Bouderman, Mr. Dodge, and Mr. Parker the draftsman.

Q. Now, what is the scale of the model?

A. Forty feet to one inch; one inch represents forty feet.

Q. And is that true of every raise and every level and every winze represented on that model?

A. Yes, sir.

Q. All drawn to that scale?

A. Yes, sir.

Q. You had the notes of the survey to aid you in constructing the model?

A. No I had no access to the notes.

9 Q. I will state—did Mr. Richardson check this model with you from time to time, as it was being constructed?

A. He checked quite a good deal of it I don't know how much.

Q. Is the model constructed correctly—It is in accordance with the date which you say you used?

A. Yes, sir, it is.

Mr. Dickson: I think that is all.

Cross-examination.

Mr. Lindley:

Q. The correctness of the model of course depends upon the correctness of the survey?

A. Yes, sir.

Q. You did not make any of the surveys yourself, therefore you are not a surveyor?

A. No, sir.

Mr. Lindley: We have no objection to the model going in subject to such criticisms as we have to make after our engineers have an opportunity to inspect it.

The Court: The model will be known as Defendant's Exhibit "A."

Mr. Lindley: That is all.

WARREN V. RICHARDSON, being called and duly sworn as a witness on behalf of the defendant, testified as follows, to wit:

10 Direct examination.

Mr. Dickson;

Q. Your name and your age Mr. Richardson?
A. Warren V. Richardson, age thirty seven.
Q. And you reside where?
A. Tonopah, Nevada.
Q. How long have you resided in Tonopah?
A. Twelve years.
Q. What is your business?
A. Surveyor and engineer.
Q. Did you graduate at any school of mines?

Mr. Lindley: We will admit Mr. Richardson's qualifications as survey- and engineer.
Mr. Dickson: All right.

Q. You are in the employ of the West End company, the defendant in this case?
A. I am.
Q. How long have you been in the employ of that company?
A. Nine years.
Q. You have made a survey of all of the underground workings of that company both within its—within the boundaries of its West End Claim and all workings of that company done beyond its vertical boundaries?
A. I have, either myself or under my direction.
Q. At the time or times or during the period that you were engaged in making surveys of those underground workings, was there or are there now any old workings that were inaccessible to you?
A. I think not, within the boundaries of the West End Claim.
Q. Well, the workings of the West End company beyond its vertical boundaries,—are there any that are now inaccessible?

11 A. Yes, there are workings beyond the boundaries that are inaccessible.

Q. You can point those out on the model?
A. Yes, sir.
Q. How closely, if at all, Mr. Richardson have you checked the work of Mr. Pierce, on this model with your notes?
A. I have checked it sufficiently to testify to its accuracy.
Q. How is that?
A. I have checked it sufficiently to testify to its accuracy.
Q. What do you say as to whether or not it is accuarate in accordance to your survey, in all its details?
A. It is.
Q. What is the red color on that model intended to represent?
A. Represents the West End or south dipping vein.
Q. And the yellow?
A. The north dipping vein.
Q. This looks to me like black—what is that intended to represent?
A. That represents rhyolite.

Q. This very dark brown is what I am pointing to?
A. It is called rhyolite.

Mr. Lindley: Tonopah rhyolite?
Mr. Dickson: I don't know, just call it rhyolite.

Q. And the purple what is that intended to represent?
A. The purple represents trachyte.
Q. And the green wherever found on the model, what is that intended to represent?
A. The light green represents a-desite-cap and the dark green represents Brougher dacite-cap.
Q. So that the green wherever shown represents the cap-
12 rock whether it be the brougher or the andesite?
A. Yes, sir.
Q. What is the blue on the model, what is that intended to represent? What does the blue represent wherever you find that color?
A. The blue represents faults.
Q. Is that true in every instance where you find blue? I call your attention to stations 461 and 456 or 459, I guess it is, two little narrow blue strips, is that intended to represent faults?
A. It is.
Q. On this model where we have the blue, is the extent of the dislocation or throw of the country where it has been appreciable indicated on the model?
A. Wherever the workings have been displaced, and the model represents the workings, its shows that displacement.
Q. For instance in Calling your attention to what we have in blue here where you find the figures 409 from the top to the bottom of that, does that represent the extent of the drop or throw?
A. Not necessarily, because that only shows one segment of the faulted section.
Q. Does that show the extent of it in that immediate segment?
A. It shows a partial extent of the displacement.
Q. The entire segment there is not developed, not determined?
A. Not to my knowledge.
Mr. Lindley: That is an up-raise along the fault?
A. Yes, sir.

Mr. Dickson:

Q. Now, I see a number of places on the model where we have a neutral or grey color, what is that intended to represent?
13 A. Well, that is just a neutral color, the neutral color is just a priming coat for the model. It does not represent geology.
Q. State whether or not in your judgment, and from your examination of this model, all of the underground openings made by the defendant, the West End Mining Company in the territory here in controversy are represented on that model?
A. All of the openings made by the West End Mining Company that are accessible are represented on the model?

Q. Where are there any workings not accessible and therefore not shown on this model?

A. Well, I will change that Judge, all of the workings within the boundaries of the West End Claim are represented on the model.

Q. Every opening?

A. Every opening.

Q. And southerly of the south side line of the West End claim, are all the workings and openings that have been made by the West End company or by the Jim Butler Company, within the limits covered by this model, are they shown on the model?

A. I wouldn't say that the workings outside of the West End claim itself are complete in all respects; *there* are complete as far as the maps that were furnished us.

Q. Of course I understand. I will get at it this way. Are all of the workings referred to in my former question that have been driven prior to the first day of November of this year shown on this model?

A. Within the West End claim, yes, sir. But within the boundaries of the claims adjoining the West End shown on the model—the work on the model is complete as far as our maps and surveys have taken them. There is some places that are inaccessible and there is some work that is unimportant.

Q. Well all the workings or openings of which you have made surveys—are they represented in the model down to the first of November of this year?

A. They are.

Q. And the extent of any workings of which you have not made survey and which you have not shown on this model, are they minute or considerable?

A. No, would be very inconsiderable.

Q. Do you understand that this model is intended to be a true representation or reproduction of all of the underground workings in the West End Mining Company's claim and the workings done by the West End mining company beyond the southerly side line, with the limitations you have already given?

A. It is.

Q. Have you the notes of your surveys with you so that Counsel for Plaintiff, if they wish to, may cross examine you on them?

A. They are available.

Q. You have them with you here in Court?

A. I haven't them in Court, no.

Q. Will you bring them at noon?

A. Yes.

Mr. Lindley: I suppose the notes have been platted, are they not, Judge Dickson, so far as their horizontal plan is concerned?

Mr. Dickson: Yes; I might say that the composite or general plan map was not completed this morning, some coloring to be done, and we will have it here at noon.

Q. This model is drawn upon the same scale as your composite or horizontal line map?

A. It is, forty feet to the inch.

Q. And the numbers found upon this model, of which there are a very great many, are the workings, and the work in which any one or more of these numbers are found, have a corresponding number upon the composite map?

16 A. Yes, they have.

Q. What is the wire top of this Defendant's exhibit "A" intended to represent?

A. Represents the contour of the surface.

Q. Is that from the surveys made by yourself, or under your direction?

A. Or under my direction.

Q. You may pull down, Mr. Richardson, such maps — are in the case here. Never mind that, I can recall you after the noon hour.

Mr. Lindley: I think, Judge, you can go right along.

The Witness: We will take these plans first, if you wish.

Mr. Dickson: I would like to have this marked Defendant's Exhibit B. The record will be confused if they are not marked.

Q. I call your attention to the map marked Defendant's Exhibit "B," and ask you what that represents?

A. That Exhibit "B" represents the 200 level of the West End mine and other mines adjoining on the same elevation.

Q. What claims are represented in whole or in part upon the exhibit "B"?

A. The West End, MacNamara, Burro, Valley View, Eureka, Curtis, Heller and Sunset.

Q. The West End is represented on that exhibit in full, is it?

A. It is.

Q. And is it correctly platted, according to your survey?

A. It is.

Q. A portion of the other claims named are represented on that map, are they—those portions correctly platted?

17 A. They are.

Q. I wish you would explain the workings, underground workings that are displayed upon Exhibit "B"?

A. The underground workings which are on this exhibit are the workings from the 200 level of the West End main shaft to the MacNamara shaft and drifts and cross cuts on this level. From the 200 level of the West End, there is a raise 250, connecting with the intermediate, and the stope shown on the map. Above the 160 level, a raise 160 connects with an intermediate level, a raise 154 also connects with an intermiedate level above.

Q. Go ahead. I want all the openings.

A. You want all of the raises mentioned in detail?

Q. Yes.

A. The Porcupine shaft is shown on this map where it intersects the level.

Q. Well, how is it designated on the map, so the record will show what you are referring to?

A. Porcupine shaft is designated on the map by its name.

Q. Well, give it?
A. Porcupine shaft, collar elevation 6042.

Mr. Lindley:

(Q.) What is your datum, please?
A. 5816.
Q. The datum plane. Do you take the sea level, or arbitrary level?
A. Oh, the sea level elevation.
Q. Then, your elevations are all plus elevations?
A. Yes.
Q. Proceed.
A. I have shown the—this map shows the stopes between——

Mr. Dickson:

(Q.) Just wait a moment. Are there any other workings
18 on the map before you come to the stopes which you have not called attention to, in through here?
A. I will go right along the level, Judge, and name them in detail.
Q. All right.
A. Commencing at the West End shaft, the map shows the workings on the 200 level going north along cross cut 201, to a cross cut 202, going west to drift 203.
Q. What is that?
A. Which follows along——
Q. Drift 203, did you say?
A. Yes.
Q. Just give the station number. What is the yellow on that exhibit B intended to represent?
A. The yellow on this map represents the north vein.
Q. The north dipping vein. And the red?
A. The West End vein, south dipping vein.
Q. Are all of the workings on or above the 200 level, all the workings of the Defendant company shown upon that exhibit "B"?
A. They are.
Q. Are they correctly platted, according to the notes of your survey, or the surveys made under your direction?
A. They are.
Q. Turn down the next map. Calling your attention to the map marked "Defendant's exhibit C," I will ask you of what level that is a map?
A. That is the 300 level of the West End. And the third level of the Jim Butler.
Q. How is the third level of the Jim Butler colored on that map?
A. Well, the color represents the geology, Judge.
Q. Well, what is the color that is shown on that map intended to represent the Jim Butler——
A. It is the purple to the largest extent.
Q. The working colored purple there is intended to

represent the geology of what you referred to as the Jim Butler 300?

A. Yes, the major part.

Mr. Lindley:

(Q.) May I ask if the geological coloring on the maps follow- the same scheme as on the model?

A. Yes.

Mr. Dickson:

(Q.) Are all of the workings of the West End Company of the 300 level displayed on that map?

A. They are.

Q. And the red there represents the West End?

A. Yes.

Q. Go to the next one. Are the claims or the portion of the claims that are platted on this exhibit "C" correctly platted?

A. They are.

Q. And the workings shown thereon are correctly platted, according to your surveys?

A. They are.

A. Calling your attention to the map marked "Defendant's Exhibit D," I will ask you what that is intended to represent?

A. Represents the 400 level of the West End and the working in the adjoining mines at the same elevation.

Q. Does that represent all of the workings of the Defendant, the West End Company on that level?

A. It does.

Q. Represents them correctly?

A. It does.

Q. And the color scheme is the same on the model as on the other maps just referred to?

A. Yes, sir.

Q. And are the workings displayed on this exhibit correct according to your surveys?

A. Yes, sir.

Q. And the claims thereon are also correct?

A. Yes, sir.

Q. Take the next one. Directing your attention to the map marked "Defendant's exhibit 'E' "?

A. Yes, sir.

Q. Of what level is that a map?

A. That is a map of the five hundred foot level of the West End.

Q. Of what?

A. Of the five hundred foot level of the West End and of the workings in the adjoining mines from approximately the same elevation.

Q. What adjoining mines?

A. The Jim Butler and the Tonopah Mining Company on this sheet.

Q. The Tonopah Mining Company's workings are shown upon

this plat immediately east of the West end line of the West End claim?

A. Yes, sir.

Q. And the workings of the Jim Butler company shown upon this exhibit are in purple as before?

A. Well, it is rather confusing because there is so much purple on the others.

Q. Can you give the beginning and the end of the workings
21 on that map that are Jim Butler workings?

A. Yes, sir. The Jim Butler workings extend as shown on the map from near the Fraction No. 1 shaft.

Q. So designated on the map?

A. So designated on the map, and to the southern boundary of the West End Claim taken in a northwesterly direction.

Q. And do the cross-cuts or openings from that, extending from the level that you have just designated—are they also Jim Butler workings?

A. They are.

Q. Does that map show all of the workings of the West End *End* company on that level?

A. It does.

Q. Are *are* they all correctly platted according to your survey?

A. They are.

Q. And the claims are correctly platted as shown on that exhibit "E"?

A. Yes, sir.

Q. Coming now to defendant's Exhibit "F"—that is a map of what level?

A. That is a map of the six hundred level of the West End and of the adjoining claims at approximately the same elevation.

Q. You mean the Jim Butler workings?

A. And the Tonopah Mining.

Q. And are all the workings of the West End company displayed on this map?

A. They are.

Q. Correctly, according to your surveys?

A. They are.

Q. And the claims are correctly represented there to?

A. They are.

Q. So far as they are represented?

A. They are.

22 Q. Now go to the next one. Calling your attention to defendant's Exhibit "G" is that intended to represent the sections on it, marked section "A" at the bottom of the map, Section "B" Section "C," Section "D" what is section "A"? Is that a cross section?

A. Section "A" represents a cross section.

Q. Taken how near the east end line of the West end?

A. Represents the section as shown on the plan, exhibits B, C, D, E, & F.

Q. How is that?

A. Represents the section as shown on the plan, exhibits, B, C, D, E, & F.

Q. Well, we have got the plan map before us, and show us on just what line that section or plan is taken?

A. Yes, sir.

Q. The section B,—that is another cross section?

A. Yes, sir it is.

Q. And through this vein or cross section?

A. Yes, sir.

Q. And is that true of section C, and also of section D?

A. It is.

Q. And coloring there the yellow is intended to represent the north dipping vein?

A. Yes, sir.

Q. And the red the south dipping vein?

A. The red the south dipping vein and the yellow the north dipping vein.

Q. Yes, that is what I intended. The south dipping vein on the model, and what else does it show?

A. The red also represents the Fraction vein.

Q. What are the markings on that section A of exhibit G, is that the fraction vein? So that the record will be able to identify them?

23

A. North cross-cut 602.

Q. Point to it.

A. (Indicating.)

Q. Any other workings?

A. Stope No. 6.

Q. That is also on the Fraction vein?

A. Yes, sir. West drift 702.

Q. And the purple on section A, Exhibit G, is intended to represent*ed* what?

A. The purple represents trachyte.

Q. Above and below this south dipping and this north dipping vein?

A. Yes, sir.

Q. And what is this color down here, this brown color?

A. That represents West End rhyolite.

Q. Just opposite the word intermediate,—between the word intermediate and the word extended and known,—what is that intended for?

A. West End rhyolite.

Q. Going to section B on Exhibit G, there is the yellow representing of course the north dipping vein, and the red representing the south dipping vein?

A. Correct.

Q. And the red marked "Fraction vein" on this section B, and in it we find also a mark "Raise 718" West Stope No. 8, W. D. 702, repeated, W. D. 702 and down to the foot of the workings marked "Raise 601-A,"—are they all on what you call the Fraction Vein?

A. They are in whole or in part.

Q. And the purple there represents the geology as you stated before?

A. Yes. The legend at the bottom of the map shows.

24 Q. Now coming to "C"—that is a cross section taken where?

A. This cross section C is taken through the McQuillan shaft on the West End claim.

Q. And the mine is shown on your plan map?

A. It is, yes, sir.

Q. Is the Fraction vein shown upon this section C?

A. It is.

Q. And how is it designated on the map? Just so we will not get it confuesed with the West End here?

A. The Fraction vein is designated by the red vein passing through 422-D, 422-N. R. 422-A.

Q. And to what figure?

A. To the figure 16 ft. E.

Q. Any other portion of what you call the Fraction Vein shown upon this section?

A. How is that?

Q. Is there any other portion of what you call the Fraction Vein shown upon this section?

A. Yes, sir. There is a segment of the Fraction vein shown above the south vein as designated.

Q. A mark over it?

Q. The West End vein?

A. The West End vein.

A. And marked over with the word "Fraction."

Q. And what is the blue line there intended to represent, between these two portions or segments of what you referred to as the Fraction vein?

A. The blue line represents a fault between the segments of the Fraction vein.

Q. And what is the purple here? Represents trachyte here on this section I take it?

A. Yes, sir.

Q. Lying above all of the veins?

A. Yes, sir.

Q. And what color do you call this between the veins?

25 A. That is brown.

Q. What is that intended to represent?

A. West end rhyolite. Well, I will say rhyolite.

Q. Take section D. that is another cross section taken from these veins?

A. It is.

Q. That is, as I understand it, taken near the west end of the stope on the West End claim?

A. It is.

Q. The purple there represents trachyte, as I take it?

A. It does.

Q. Is there any vein represented or intended to be represented on that map, other than the west end vein proper, colored in red?

A. There is a separate vein or a branch of the West end vein,—I am not testifying as to what it is.

Q. As an expert?

A. Yes, sir.

Q. But you know what it is intended to represent on this section in which we find the following letters and figures,—D. 502, R. 586, 445 I, W. 440; D. 409; R. 440, and then continuing—upward to the determination; what is that?

A. That represents the position of a vein.

Q. That lies above what we call the West end vein?

A. It does.

Q. But whether it is part of it or not you do not undertake to venture an opinion; you are not an expert?

A. That is right.

Q. How on all of your maps are your station numbers indicated?

A. They are indicated,—on the ground and on the map?

Q. On the map?

A. They are numbered, indicated by numbers and in some cases by letters after the numbers.

26 Q. Almost universally the station is indicated by a circle with a number?

A. Yes.

Q. How are your elevation points designated upon all of your maps?

A. The elevations are designated upon all the maps by the initials E. L.

Q. Followed by the number?

A. Followed by the numbers of the elevation.

Q. And your datum plan was the sea level?

A. Yes.

Q. You stated that this model Exhibit "A" was intended to, and substantially does show all of the underground workings of the Defendant Company. I am reminded that far below any workings shown on the model there are other workings of the Defendant Company within the boundaries of the West End claim. Is that true, that are not shown on the model?

A. Yes, but they would not come within the plane base.

Q. Yes, I know, but I just want to make your answer correct. How far beneath—those underground workings are downward and branching off from this shaft?

A. The shaft cuts those.

Q. What shaft?

A. The main shaft of the West End.

Q. Point it out on the model.

A. (Witness does so.)

Q. The one you are now pointing to. How is it designated, if at all, on the model?

A. The shaft is marked West End shaft.

Q. Now, how far beneath any of the stopes or workings shown on

the model do you go down in that shaft before you encounter
27 any other workings running off from the shaft?
A. About 350 feet.

Mr. Dickson: I think that is all that is necessary in direct, Mr. Lindley.

The Court:

(Q.) Mr. Richardson, what do you mean by the McQuillan shaft?
A. The shaft in the eastern portion of the West End claim, Judge.

Mr. Dickson:

(Q.) How is that marked, if at all, upon the model?
A. That shaft is marked, "McQuillan's shaft."

Mr. Lindley:

(Q.) That is the discovery shaft of the West End, is it not, Mr. Richardson? The McQuillan shaft is the discovery shaft of the West End? That is the shaft on which the patent is based?
A. It is the continuation of the discovery shaft.

Mr. Dickson: In that shaft was the discovery.
Mr. Lindley: In that shaft. You do not want to concede, of course, that you did not have any discovery.

Cross-examination:

Mr. Lindley:

(Q.) Mr. Richardson, this colored scheme that has been adopted in the model, particularly with reference to the geological definitions, are you responsible for that?
A. No. The coloring shown there to designate the different formations put on by instructions.
Q. You determined those formations for yourself or were you instructed to put them on there?
28 A. I was instructed to put them on.
Q. Then, you do not hold yourself responsible for the geology?
A. No, I do not.

Mr. Dickson: We did not put him on as an expert at all.

Mr. Lindley:

(Q.) How about the naming of those different rocks, the names by which you have identified the coloring? Who is responsible for the naming of those, you, or the geologists?
A. The geologists.
Q. You have simply painted the model and colored your map under the direction of the geologists?
A. They were colored, yes, under direction.
Q. They are done under your direction, however?
A. Yes.

Q. And the coloring was put on by the geologists. Now, may I ask you, briefly, to repeat the names given to the different rocks as identified by the different colors starting with the—I take it that the yellow and the red indicate veins, the yellow indicating the north dipping vein, and the red is what you call the West End vein, and in parts the Fraction vein. Is that correct?

A. It is.

Q. So that the only colors we have to deal with on the subject of geology are colors other than the red and yellow?

A. It is. And blue.

Q. Blue represents faultings. Now, you said the light green represented what?

A. Andesite cap.

Q. That is the andesite, no prefix to it to determine what kind of andesite it is or anything of that kind, just andesite. Plain andesite.

A. Well, andesite cap.

29 Q. That is the cap rock that overlies the entire vein system. Is that right?

A. Yes.

Q. Well, you do not know, you are not a geologist; pardon me. Now, the dark green represents what?

A. Brougher dacite cap.

Q. Now, your purple?

A. Purple represents trachyte.

Q. Without any qualifying or classifying adjective, just plain trachyte. The black or brown, what is that? Brown, that dark brown?

A. Yes.

Q. What is that?

A. Represents rhyolite.

Q. Now, have we any other colors typical—that is, identifying the geological structure according to the designation given you?

A. No, that is——

Q. That is all. In reference to the stopes colored yellow within the MacNamara boundaries, these were made from actual surveys?

A. They were.

Q. And that is true of all of the stopes shown upon the model and upon your maps?

A. Yes sir.

Q. Are all the workings in the MacNamara ground within this section of the mine shown upon this model?

A. No sir.

Q. Why were they not shown?

A. They are inacessible.

Mr. Dickson: I can not hear you.

A. In many places they are inac-essible.

Mr. Lindley:

(Q.) But such as are represented here are represented by actual survey?

A. They are.

Q. I believe that both sides to the controversy have had the opportunity of surveying in the MacNamara ground so we
30 should have the same data that you have?

A. Excepting there are places where the stopes are caved; there are sections of the MacNamara that are caved now that I had the notes before they were caved.

Mr. Dickson: As shown on this model?

A. Yes.

Mr. Lindley:

(Q.) Were you formerly the surveyor for the MacNamara?

A. Yes.

Q. Then, much of these stopes—many of these stopes are now inaccessible, but they are correctly marked on here from notes made by you before the ground caved?

A. Yes.

Q. That is correct, is it?

A. Yes.

Q. And you have those notes?

A. Yes.

Q. Have those notes been available to the Jim Butler Company?

A. Yes sir.

Q. They have had copies of those notes?

A. Oh, no, they have been available to them. Whether they got them or not, I could not say.

Q. You mean that if they had asked for them, they could have gotten them?

A. Yes.

Mr. Dickson:

(Q.) And can now?

A. And can now.

Mr. Lindley:

(Q.) You do not recall that they have asked for them?

A. They may have had them, yes. I did not get them——

Q. I do not apprehend that there is going to be any controversy over them, but I just wanted to get at what can be inspected on the ground now and what is closed. What portion of these stopes in the McNamara are closed, caved?

31 A. The stopes that are caved are mostly about the center of the claim; and the stopes near the western boundary of the MacNamara claims, near the top, are caved. I can't say exactly the extent of the cave.

Q. Now, with reference to the workings beyond and to the east of the West End boundaries, those are in the workings of the Tonopah Mine, are they not?

A. It is.

Q. Both parties have access to those mines?

A. Yes, I understand so.

Q. Does that represent all the workings adjoining the West End

boundaries within the Tonopah mining ground that are accessible at this time?

A. No, represents as far as we are able to get with the model in the time that we had.

Q. Well, that don't purport to be a complete representation of all the underground workings in this section of the Tonopah mining ground?

A. It does not represent all the workings, but as far as the portion shown here is represented, it is complete.

Q. Of course, if it is there it is there. But what I wanted to convey is as to whether there is anything left off there that might have been put on.

A. No, there is nothing left off the portion that is shown that might have been put on.

Q. That is obvious, also. I am trying to get at how complete is this in reference to an exposure of what is shown on those workings adjoining the West End line? I am not trying to trap you at all, Mr. Richardson, I am trying to get at the facts. I haven't anything up my sleeve at all in reference to this. I simply
32 want to know what the conditions are. There seems to be quite a large gap in here, and I want to know whether there are other workings here which are accessible and might have been put upon that model?

A. There are no workings in the immediate vicinity of the portion that is shown here. The workings that are adjoining the West End claim that could be shown here, a few hundred feet to the north of the portion are shown.

Q. In making the survey for the purpose——

Mr. Dickson:

(Q.) 200 feet to the north of what?

A. Of the portion of the Tonopah Mining Company workings here shown.

Mr. Lindley:

(Q.) Now, in making the surveys for the purpose of constructing this model in thar section of the underground works in the Tonopah mining ground, did you stop those surveys at these particular points on your own motion, or were you instructed to stop them?

A. No, I didn't have——

Q. Did you stop on your own motion?

A. Yes.

Q. You simply surveyed those——

A. Went as far as we had time, Judge.

Q. As far as you had time. Now, I notice overlying the lower stopes of what you call the West End vein, you have indicated an upper series of stopes painted in red. That you say is represented upon your horizontal plans and in your cross sections as the Fraction vein?

A. It is.

Q. Why did you paint it the same color as the one below?
33 Why didn't you give it a different color?
A. You will have to ask the geologists for that.
Q. Then, so far as your instructions with reference to coloring the maps and models, you have delineated under instructions from the geologists three veins; the yellow vein, what do you call that vein?
A. The north vein.
Q. You call that the north vein. The West End—the red vein, what do you call that vein?
A. The lower red vein, called the West End vein.
Q. And the upper?
A. The Fraction vein.

Mr. Lindley: I do not understand, except for geological purposes, the Fraction vein is involved here, Mr. Dickson?
Mr. Dickson: I do not think so, so far as this case is concerned.
Mr. Lindley: Yes, so far as this case is concerned, I mean.

Q. Are there any other veins that you identify, or are shown in any of the works here on this model?
A. Yes; I would not identify them myself as to what they belong to, but there are other veins shown on the model.
Q. Are there any veins in the west section here on the model that are not identified by name other than the West End?
A. In regard to the portion, upper portion of the model, above raise 580 as shown on the model, there is a vein.
Q. What do they call that vein?
A. I haven't—I am not aware that it has been designated,
34 yet.
Q. Did you ever hear of a vein called the South vein?
A. Yes.
Q. Is that the South vein?
A. I think so.
Q. You think it is the South vein?
A. Yes.
Q. Now, with reference to your cross sections, your exhibits—your plan exhibit giving the direction of the cross sections, will you pull that down? This shows "C" and "D."
A. The cross sections are shown through "CC" and "DD."
Q. Where is "A" and "B" and the others?
A. On this plan——
Q. Now, I want to ask you with reference—are these cross sections all parellel to each other, or are they drawn at arbitrary angles?
A. They are drawn at arbitrary angles, I would say.
Q. Who gave the directions as to the manner in which those cross sections should be made?
A. I selected the line. I was given directions as to what workings were to be shown, and then I took the exact line through those workings.

Q. Then, the cross section is not drawn parallel to any particular base line at all with reference to the course or strike of the vein?

A. No.

Q. It was arbitrarily, for the purpose of showing and connecting up existing works below with certain features above, is that correct?

A. They were taken to best represent all the workings in a certain direction.

Q. And that direction varied with each cross section?

35 A. Yes.

Q. Were run so as to go through the workings. In other words points were given to you and you prepared the cross sections to indicate what would be cut by a line or a plane connecting those point-, is that correct?

A. No, Judge, they were just like my instructions in the McQuillan shaft—was to take a cross section through the McQuillan shaft.

Q. And did they give you any direction as to the cross section?

A. They did not, except that it was to be through the McQuillan shaft.

Q. Well, why didn't you run it parallel with the end line, or at right angles to the shaft instead of giving the diverging course indicated?

A. Because the furtherst workings to the north in the West End Claim were *on* approximately on a line with the section taken, and any other line would not have represented, would not have represented the workings so well as that.

Q. Well, then, the idea was to connect the workings and not particularly to show vein structure?

A. That was my idea, to show the——

Q. Well, in all instances were you given the direction which your cross section was to take?

A. I was not.

Q. Well, did they simply tell you to run a cross section so as to connect up the workings?

A. Told me to select—I was told to select three workings in the eastern part of the territory, the eastern part of the territory, and one section in the western portion of the territory.

Q. Generally speaking are any two of those cross sections

36 parallel to each other, or approximately.

Q. Are approximately, but they were not laid out with the intention of being parallel.

Q. Well what is the purpose of a cross section?

A. The purpose of a cross section would be to represent *the* as much of the workings as possible within that section, to show the position of the vein in those sections, and are therefore taken approximately on the dip of the vein.

Q. What do you mean by the dip of the vein. The local dip at the point or the general dip?

A. The general dip.

Q. Well, if you take it on a general dip that would make your sections parallel wouldn't it? Didn't you consider—withdraw that

last question—Don't you consider Mr. Richardson, the structural conditions through which cross sections are usually made, that they could be taken at intervals and be parallel with each other, definite intervals, and exhibit whatever the plane of the cross section happened to strike. Isn't that the usual way of making cross sections?

A. I would not say so Judge. I would say that the cross section should be taken to illustrate the workings that you desire to show.

Q. Yes, but the workings cut no figure. It is the ore isn't it.

A. Well, the workings show the—No, the workings have an important bearing upon getting at the ore.

Q. Well, what I am trying to get at is this? It is very easy to start a structural condition by giving a cross section, is that not true?

A. There was no such intention as that.

Q. I do not accuse you of that, I am asking you generally if there is not an opportunity of a direction to a cross section, to
37 distort that to the facts.

A. Personally, I do not care for cross section at all.

Q. Will you kindly answer my question. The lawyers have to have it you know,—because we always get criticised. I am going to find out who is responsible for the directions given to those cross sections, and ask you to answer my question, isn't there an opportunity for unfairness in drawing cross sections?

A. There might be Judge, in some cases.

Q. Not in this case?

A. Not in this case.

Q. Now, in drawing these cross sections, and depicting, what is encountered by your plane through your cross section line, have you only marked the things actually cut by that plane, or have you forked something on it?

A. For the purpose of clearance and for the purpose of continuity it is necessary to project to that line, if that is what you mean.

38 Q. In other words, if the plane of the cross section does not show the exact facts, you have to go out some distance to project some things into the plane of the section to show them?

A. It is absolutely necessary in all cases.

Q. Well, how far have you wandered out from each side of your plane in order to project things in; how far is the maximum distance that you projected into the cross section?

A. I am not prepared to state that off-hand exactly, Judge.

Q. Now, let me have cross section "B"; there is a stope here marked on the map "C" stope, colored red, and then up over the yellow and around to 537-I; is that 537-I?

A. Yes, sir.

Q. Is that all one stope?

A. No, Judge. The stope stops where the cross hatchings indicates on the map.

Q. Well, what is beyond the cross-hatchings, indicated in red and yellow?

A. There?

Q. Yes. That represents a vein doesn't it? *A.* Going north——

A. Yes, sir.

Q. Is there any line of demarcation at this point between the red and the yellow? Does that indicate a fault?

A. It indicates a fault, yes, sir.

Q. But no displacement?

A. Or a fissure,—which would be the same.

Q. I am simply trying to get at a technical question. Do you intend to represent this as all ore, not having been stoped, or being still in place?

A. As all vein, Judge.

Q. Well, if it is not stoped, how can you tell? Is that
39 forced into the cross section?

A. Those are points that the experts will bring out I suppose.

Q. Oh, excuse me. Let us look at Exhibit B a minute? Well the spaces indicated on this map here, is this all one stope or more than one stope.

A. It is more than one stope.

Q. Where is the line of demarcation between then?

A. I have not drawn a line of demarcation between them.

Q. Well it is in the stope then?

A. No, Judge, it is not.

Q. It is not?

A. No, Judge.

Q. Well, how am I to tell in looking at that map where one stope ends and another begins?

A. You can tell by the section—through D — T.

Q. I will have to go to the section?

A. Yes, sir.

Q. Just turn to that section?

A. (Witness indicating.)

Q. Now tell me where the break is in that stope?

—. (Witness indicating.)

Q. Now tell me where the break is in that stope; where one stope ends and the other begins?

A. Where the stope of the West End vein ends is shown in the termination of the red against the yellow.

Q. And then if the McNamara stope comes up against it, is there any line or demarcation to indicate they are separate stopes?

A. That is a matter of vein structure that the experts will tell you about.

Q. Oh, the experts will have to tackle that, then. Well, your system of numbering—you commence a new hundred with each level,—for instance, the numbers on your two hundred level
40 commence with two hundred and three hundred with three hundred and on the four hundred with four hundred; is that your system?

A. Of numbering the stations Judge?

Q. Yes.

A. Yes, sir.

Q. You follow that system throughout?

A. Yes, sir.

Q. We have endeavored to follow the same system in our maps that you people have so that there won't be very much difficulty in getting at it.

Mr. Dickson: That is all.

Mr. Lindley: I suppose that the exhibits may be introduced in evidence, of course. subject to our objection?

Mr. Dickson: This cross section may be known as Exhibit G.

Redirect examination.

Mr. Dickson:

Q. Is there anything being projected, to your knowledge, to the plane of one of these sections, so far as the geology represented on each of those sections is concerned?

Mr. Lindley: Well, he says that he is not responsible for the geology.

Mr. Dickson: Well, maybe that is so.

Q. Have you projected anything except workings to the plane of the section.

A. I have not.

41 Q. Are you able to say whether or not the cross sections were taken, or intended to be taken at right angles to the strike of the vein, at the place where the cross section was?

A. In a general way they were.

Q. One word about certain cross *examination*—and referring to the upper vein in Red near the west end of the stope on the south dipping vein, we find the figures 586-445-W. 440; 440;—I understood you to say to Mr. Lindley that that was what you understood to be the south vein, so-called. Do you know of a certain agreement or paper that was signed between the two contending companies along about the latter part of December, 1912, in which the south vein was referred to?

A. I do.

Q. Well, at that time, at the time that paper was executed, was the workings in this upper vein, in which we find the figures in my former question that I have just repeated, had that work been done at that time?

A. It had.

Q. It had been done?

A. The winze partially. Winze 440 had been sunk and the drift 409 had been run.

Q. What else had been done at that time on that upper vein?

A. And the workings marked W-44—if it had been done.

Q. What else.

A. Drift 445; raise 586.

Q. Not marked raise; just 586 on this model. What else?

A. I could not remember anything further than that.

The Court:

Q. Mr. Richardson, from where you are standing where is south?
A. I am facing north, Judge, now. This is north.
42 Q. Is there any reason why the model should not be placed so as to conform to the directions in the region where we are?
A. I think that is a good suggestion, we can try it.

(Witness readjusting model.)

Mr. Dickson: Is that about right now?
A. Yes, sir.

Mr. Peck: The disputed territory is away from the court now.
Mr. Dickson: You can get a better view looking at it from the east end of it.

Mr. Lindley: Have you got that properly oriented so that the red vein dips to the south?
A. Yes, sir, that is correct now.

(At this time an adjournment was taken until this afternoon Tuesday, December 8th, 1914, at two o'clock P. M.)

43 Afternoon Session.

December 8th, 1914—2 o'clock p. m.

The Court: Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.
Mr. Dickson: Just a moment, if the Court please. I will have this map marked Exhibit "H."
(The map so marked.)
Mr. Dickson: Mr. Richardson.

Testimony of WARREN V. RICHARDSON, whom being recalled herein as a witness on behalf of the Defendant, testified as follows, to wit:—

Direct examination.

Mr. Dickson:

(Q.) Directing your attention to the map, Defendant's Exhibit H, I will ask you what that is?
A. That is a map, a composite map of the West End workings.
Q. Of the 2, 3, 4, 5, and 6 levels of which you have level sheets already referred to?
A. Yes.
Q. And of the works connecting from one level to another, I take it?
A. Yes.
Q. What is the color of the 200 level on this exhibit H?
A. The 200 level is colored pink.
Q. And the 300?
A. The 300 yellow.
44 Q. The 4?

A. Green?
Q. And five?
A. Orange.
Q. Orange, did you say?
A. Yes.
Q. And the six?
A. Violet.
Q. I do not see that you have indicated on that map the claims through which the cross sections were taken?

Mr. Lindley: I would like to suggest, Mr. Dickson, that I would like to have the plane of this cross section marked on the map so we can see the relative position to each other.
Mr. Dickson: Yes, I want that on there. I had not noticed it was not there.
The Witness: They are on in pencil, but they have not been linked in, Judge.

Q. Well, take the map this evening when Court adjourns and put these lines upon the map so they will appear distinctly. One other question about the model. Will you give to the Court the angle of the dip of the south dipping vein, the average angle of dip of the south dipping vein from its top, shown in red upon this model. "Exhibit A" down to the foot of what is marked on the model "W" 664; I suppose that means winze 664, doesn't it?
A. Yes.
Q. From the top, then, down to the bottom of winze 664 give the average dip and the distance?
A. I will have to get a scale.
Q. You ought to have had a scale with you. I will correct the latter part of that question, instead of saying down to the bottom of winze 664, down to the end of the red, near the bottom of 664. It has been suggested to me that you take cross section "D," and you can get that much more quickly, Mr. Richardson.
A. Yes. Would be between 30 and 35 degrees.
Q. And the distance? Scale it here, if it is shown upon this.
A. It does not show the winze.
Q. Well, go to the model, then. Give up approximately, not accurately, a few feet one way or the other.
A. About a thousand and thirty feet.
Q. Are you sure about that? Have you made a mistake about that? I did not think it was that much.
A. I will check it. 1040 feet.
Q. How much?
A. 1040 feet.
Q. Now, give the average dip near the West End of that south dipping vein, as shown on section A of Exhibit G?

Mr. Lindley: May I get the points from which he calculated that declination?
(Mr. Dickson indicates.)

Mr. Lindley: The top from which he starts the measurement is in the MacNamara ground?

Mr. Dickson: That is very true.

Mr. Dickson:

(Q.) Now, you have in mind the last question, give the average dip of the south dipping vein, or West End vein, as is shown upon Section A of Exhibit G? The average dip first?

A. About 17 degrees.

Q. And the distance from the top to the bottom of the West End vein as shown upon that section?

A. 895 feet.

Q. Now, the territory through which that section that it is taken is within the limits of the injunctional order that was issued in April or May of this year, is it not?

46 A. No.

Q. And no work has been prosecuted to the deep on the portion of the vein through which that section was passed since that injunctional order was issued by the West End Company?

A. Why, inadvertently they went over the line there.

Q. I mean down at the bottom part?

A. No.

Q. Measured along the northerly side line of the West End claim, do you know what the distance is from the east end line to the point where the south dipping vein at its apex and on its course crosses the northerly side line of the West End claim, if at all?

Mr. Lindley: I wish to interpose an objection there that he assumes an apex.

Mr. Dickson: Well, what we claim to be the apex.

Mr. Lindley: I think we had better define that very clearly.

Mr. Dickson: I can meet that objection.

Mr. Lindley: You can take arbitrary dips at any points and designate the points but I do not think you can have the witness here say that it is an apex.

Mr. Dickson: What the Defendant claims to be the apex.

Mr. Lindley: Well, he may not know. It seems to me that is for the Court to determine. You may take your dip lines from any point and use that in argument that that is the apex, not proving that it is an apex. My objection to the question is that it assumes a fact that the witness don't know.

(Further discussion by Counsel.)

Mr. Dickson: I think that I will reframe the question so as
47 to meet one objection of the gentleman, and then I think it is proper. I will take a ruling on it.

Q. Do you know what is claimed by the Defendant in this case to be the top or apex of the West End south dipping vein?

A. I do.

Q. Can you tell what the distance is from the east end line of the West End claim, measured along the northerly side line of the claim to the point where, if at all, the top or apex, or what the Defendant

claims to be the top or apex of the West End or south dipping vein crosses the northerly side line of the West End claim?

A. I can.

Q. What is the distance?

A. It is about 1,142½ feet from the east end line of the West End claim, measured along the north side line of the West End claim.

Mr. Dickson: That is all.

48 Cross-examination.

Mr. Lindley:

Q. What do you understand is claimed by the defendant in this case to be the apex of the vein?

A. I understand the top of the West End vein to be claimed as the apex of the West End vein.

Q. Where is the top?

A. The top would be the highest point where the trace of a line in a horizontal plane would cross the side line of the West End claim.

Q. Please point that out on the model and designate it by number?

A. It is not shown; the exact point is not shown here because it comes outside of the workings, as excavated.

Q. Well you pointed your pencil at that time to what purports to be a black line running to a stope. That line is what?

A. That line represents the side line between the West End and McNamara lode.

Q. Is it your idea that the claim of the defendant in this case is that the highest follows from the low up to where the model indicates a change in erection, in the opposite way, is the top of apex of the vein; is that it? That is where the vein ceases to have a course downward or upward?

A. Where the West End vein ceases to have a course upward.

Q. Yes. That is what you understand as the claim of the defendant in this case?

A. I do.

Q. The line of demarcation which is shown on your model here immediately north of figure 152 represents what you understand is claimed to be the apex or line of demarcation between the red and yellow?

A. As near as we can represent it on the model.

49 Q. What is there in the ground to indicate a difference between the roll to the south, or dip to the south and the dip to the north? Any physical interruption?

A. I am not prepared to testify on that, Judge; in my calculation I have taken the highest point of the West End vein.

Q. Well assuming that instead of being two veins that is an anticline, you take the axis of the anticline as representing the apex. Is that correct?

A. If it were, I would yes sir.

Q. Your idea is that they are claiming the axis of the anticline as the termination of the West End vein, on its upward course, and

the commencement of the McNamara vein on its downward course?

A. Not necessarily.

Q. Not necessarily?

A. No.

Q. Well, explain?

A. I would have to go into the structural features of the two veins in order to do that, and I am not prepared to testify as to the structural features.

Q. Well, then, we will drop that. According to your notion then, and as embodied in the question of counsel for the defendant,—the top of this so-called West End vein, at the west terminus of it, is in the McNamara ground?

A. It is, beyond the west from the point where the line of apex crosses the side line.

Q. Where does that line, that line of claimed apex cross the side line, is it shown on that model?

A. It is not, Judge; unfortunately it is impossible to represent it as it falls in space.

Q. In what?

A. It falls in space.

Q. Isn't it a matter of fact that all of your model is in space? Does it represent anything but space?

A. The work in solid represents excavation, the space rep-
50 sents solid.

Q. This point where this apex crosses the side line on the northerly side line of the West End, is not marked on that model?

A. It is not.

Q. Well how do you calculate where it is? Is it marked on your map?

A. No, I have not marked it.

Q. Then you measure from the extreme east end of the mine up to a point which you assume to be a place where the West End vein terminates, on its upward extention?

A. I worked it out from a stope plan and a plan of the West End and McNamara lodes.

Q. You have been in these stopes both the McNamara and West End, and followed that vein on the roll from the West End over into the McNamara ground, have you not?

A. I have followed from the West End vein to the McNamara workings, through the top where they connected, as shown in the model.

Q. Isn't that all one stope in the McNamara ground indicated in the red and yellow?

A. They could be considered as one stope or two stopes.

51 Q. How long have you been familiar with this ground?

A. With the workings, do you refer to the workings of the West End MacNamara?

Q. Yes sir.

A. Since March or April, 1905.

Q. March or April, 1905. You were in the employ at one time of the MacNamara Company, were you not?

A. I was in the employ of the MacNamara and West End Companies at the same time.

Q. Do you recall the fact that there was litigation between the West End and the MacNamara company at one time?

A. I do.

Q. Were you employed by either company at that time in connection with that litigation?

A. By both companies.

Q. By both companies. Was there any discussion at that time as to the position of that apex?

A. There was.

Q. Did you reach any conclusion at that time as to the apex?

A. I did not.

Q. Did not. How is this vein which you now call the West End vein been usually designated by the West End Company prior to the commencement of this litigation?

A. I could not say, Judge, that it was ever designated officially. It is called the main vein.

Q. Did you ever hear it called by the West End Company the MacNamara vein?

A. I have often heard it called that.

Q. By the West End Company?

A. Not by the West End Company.

Mr. Dickson:

(Q.) I can not hear.

52 A. Not by the West End Company.

Mr. Lindley:

Q. Well, by officers and agents of the West End Company?

A. No.

Q. Were you employed by either the West End Company or the MacNamara Company at the time of the making of a contract with regard to the south vein?

A. I was in the employ of the West End Company at the time.

Q. You recollect that circumstance, do you not?

A. I am not familiar with the details, but I recollect the circumstance.

Q. Do you know how this vein that you now call the West End vein was designated in that contract between the parties?

Mr. Dickson: That will speak for itself, that contract will, I suppose.

Mr. Lindley: I am asking the witness if he knows.

Mr. Alling: Well, if the Court please, it does not appear that he knows anything about the contract. He knows about the incident; it is not shown that he knows the contents of the contract.

The Court: The objection is overruled. He can say whether he knows or not. That can be answered yes or no.

A. Yes.

Mr. Lindley:

(Q.) You do know. What was it called?

A. South vein in the contract, although I do not know whether the south vein referred to the entire West End vein, or to just the portion that the agreement was on.

Q. Well, you do not know, then, what that—I suppose the agreement will speak for itself. Your calculation as to the dip of this vein is based upon the assumption that there are two veins
53 there, is that it, the West End and the MacNamara?

A. Do you mean, Judge, the dip in the West End ground of this vein?

Q. I am speaking of the vein as a whole, the two veins considered. Do you consider that part of the MacNamara and that part of the West End vein as two veins in your testimony as giving the dip of that vein on the highest point, on the upward point of that vein? You call that a dip because you say that is from the apex, and therefore you must consider—do you consider that if that vein was the only vein and simply rolled over into the MacNamara that your designation of the dip, your explanation of the dip would be the explanation of the dip of that vein as a whole?

A. Well, I was considering it entirely as being the dip of what I considered to be the West End vein.

Q. And considering that that was the end of the West end vein?

A. Yes.

Q. The top was the end of the West End vein?

A. Yes.

Q. And if it should turn out to be the fact that it is all one vein, the yellow and the red, why, of course, your dip would not respond to the dip of the vein as a whole?

A. Well, one dips northerly and the other dips southerly. It is hard to consider that.

Q. Well, I understand your explanation is based upon the proposition that the highest point that you have reached from the bottom workings going upwards was the apex, and that you had figured the dip from that point down?

54 A. That is right.

Q. That is correct, is it?

A. That is correct.

Q. And the value of your testimony, I suppose, will depend upon whether your assumption was correct that that is an apex?

Mr. Dickson: That is a question for the Court to determine and not for the witness.

Mr. Lindley: I imagine that is true, Judge. That is all.

Testimony of WALTER H. WILEY, who, being called and duly sworn as a witness on behalf of the Defendant, testified as follows, to wit:

Direct examination.

Mr. Dickson:

(Q.) What is your full name and age, Mr. Wiley?

A. Walter H. Wiley.

Mr. Lindley: May it please the Court and Counsel, it affords me great pleasure to recognize Mr. Wiley as a competent expert.

Mr. Dickson: I want to show his experience briefly.

Mr. Lindley: I have no doubt of that, but you cannot prevent me from making that courteous suggestion.

The Witness: My age is 52.

Mr. Dickson:

Q. And where do you reside?

A. In Los Angeles.

55 Q. What is your business or profession, Mr. Wiley?

A. That of a mining engineer.

Q. Where, if at all, what school of mines did you study your profession or graduate from?

A. I first studied mining as a miner. My work as a miner was begun thirty-five years ago. In 1883 I graduated from the Colorado State School of Mines as a Mining Engineer.

Q. Prior to your entering the college or that School of mines, for how long a time had you followed the business of mining, or as a miner, or whatever you call it?

A. As stated, I begun my first work thirty-five years ago. And worked some as a miner then and during the summers while attending the State School of mines, and after graduation.

Q. And when did you say that you graduated?

A. In 1883.

Q. How continuously, if at all, since that time have you followed your profession as mining Engineer?

A. For a few years after graduation I worked as a Assayer and Surveyor. After that I worked as a mining Engineer and have been continuously engaged as such down to the present time.

Q. State in a general way how you have been engaged during that period in your profession, examining mines, reporting on mines or having charge of the operation of mines—generally.

A. My work during this time has largely been the examination of mines for economic purposes, for the valuation for prospective purchasers, the direction of operations to discover ore, or the determination of the nature of the veins or deposits. During that time my work has extended into the greater portion of the United States including portions of Alaska, into British Columbia, and the Yukon Territory. And into a number of the States of Mexico, and

56 into South America and Asia.

Q. And did you mention Colorado, Montana and Idaho?

A. In Colorado I have had a great deal of work. More than in any other one State.

Q. And has your business or the pursuit of your business carried you into Montana, the mines of Montana, any of them and Idaho?

A. It has a great deal into Montana.

Q. The examination of mines also?

A. Into nearly all of the Western states.

Q. What mines—mention a few if any of the principal ofnes if any that you have had charge of the operating work?

A. I have not been a mine manager except in a small way in Colorado. Mines a half a dozen in Clear Creek County. I have examined a great many mines to advise as to the development in the search for ore in different portions of the United States and some in other countries.

Q. Have you made an examination of the West End Mining company, its workings beneath the surface of the West End Mining Claim as depicted upon the maps that have been referred to heretofore, and of the workings of the West End company extending beyond the southerly boundary?

A. I have.

Q. When did you make your first examination of that region?

A. Immediate West End Claim about a year ago.

Q. I will ask you if your examination was directed in part to determining to your own satisfaction or forming a conclusion or judgment to your own satisfaction, as to what strike, dip or the top or apex of the vein, shown upon the model, Exhibit A was?

A. It was.

Q. How long a time in all have you spent in such an examination for the purpose of such a determination?

57 A. Around a month, about thirty days.

Q. At different periods?

A. At three different times.

Q. And have you reached a conclusion Mr. Wiley, as to what the strike dip, top, or apex of the veins claimed veins shown upon the model in red are?

A. I have.

Q. Now, without further questions it will save time, be more satisfactory to the court, and all concerned I wish you would in your own way using the model where you can best illustrate what you desire to convey to the court, and the maps or cross sections where you can make your illustrations clearer by the use of those and in your own way state the result of your examination, your observations, directed to this question of the strike, dip, top and so on, and when you have concluded state to the court what your conclusion is, as to the strike and the top of this vein or deposit, shown in this model in red.

58 A. To begin at the logical place, the surface, I think the appearance of Defendant's exhibit A, the skeleton model, needs an explanation to account for the lack of workings near the surface. This is due to the fact that the veins do not exist there; they do not come to the surface because there has been a flow of eruptive rocks which has buried the vein. Over this immediate area there have apparently been two flows, one which is termed the andesite cap, and is represented by the light green, and the other which is called Brougher, or Brougher dacite cap, appears to have been a flow coming from the volcanic eruption called Mt. Brougher, and the eruptive rock flowed over the top of the previously existing andesite cap, and still deeper buried the veins beneath, so that the only

workings which show, are the vertical shafts, with the exception of a few raises which have been put up below the cap.

The effect of this is that there is no outcrop; the highest point in this vein, instead of being at the surface is deeply beneath the surface and the depth on the top beneath the surface is a varying line, shallowest at the west end, and deepening as we approach the eastern end of the West End claim.

The eastern end of the West End claim or south dipping vein contains a series of stopes, these stopes extending not only up to the end line but to the east of that end line in the adjacent property of the Tonopah Mining Company; these stopes are represented by the blocks of wood carved as nearly as possible to the exact shape of the stopes, show that they are a bond, a body of ore having a definite dip downward to the south and a definite strike easterly and westerly, essentially parallel to the side lines of the West End claim; The dip is not regular throughout, although for a distance of about five hundred feet it is unusually regular, even for fisure veins; as we go toward the west we find an interruption in these stopes, a certain section in the center where the stopes do not extend deep down; this is partly and perhaps largely due to the fact that there has been no mining development in depth; it is by no means certain that the entire vein has been worked in that section; on the other hand I fully believe that there are extensive bodies of ore in this portion at depth; and a proof of one of the reasons for this absence of work and the absence of stopes toward the surface is the fact that this portion, like all other portions of Tonopah, with which I am familiar, this portion has been extensively dislocated by faults.

Mr. Dickson:

Q. Just state what you mean by this portion?

A. The portion of the West End Claim in that vicinity of which I am now speaking. These faults run in different directions; some of them are shown upon this model by the blue coloring, but there are a great many which are not shown; there are many small fractures, slight displacements, which are encountered in working the stopes, but it would be difficult, possibly an impossible matter to show them all upon this exhibit. They are of no especial importance to the miner, as long as they do not materially displace his ore body; the throw upon most of these veins, in other words, is less than the width of the vein, so that there is no interruption in the continuity of the vein by these faults; on the other hand there are some of considerable displacement, and these do interrupt the continuity of the vein.

Q. And are those shown upon the model?

A. These are shown upon the model where they can be shown, for instance this work above the fourth level marked 490 and colored blue is marked as the Edwards Fault, a fault which extends without interruption a considerable distance in a northeasterly direction across the workings beneath the West End

claim; following up since we cannot follow from the surface outcrop down, I will follow up from the deeper workings of the West End, or south dipping vein.

At a point a short distance below the four hundred foot level we reach a change. Following up through the stopes we reach the upper end of the stope and a short distance above that we find a termination as we ascend all this southerly dipping, this West End main vein, against a plane which is represented by the yellow coloring upon this model, and is called north dipping vein, because it dips in a northerly direction.

Q. Let me make a suggestion for the record, that whenever you can you indicate on the model where it is.

A. The point to which I am now pointing is the eastern end of the West End claim, at a point in raise 569 immediately beneath the raise marked 488,—raise 569 is upon the West End claim. Raise 488 is upon the northerly dipping vein. The quartz which is largely the filling of all the veins is similar in appearance no matter from what vein it comes; there are minor differences in different veins, and there are differences in different portions of the same vein, and, broadly speaking, the quartz is the same, or at least similar in the different veins, so that the manner of determining to which vein the quartz filling belongs, is largely a question of its structure; in this case, a question of its dip. We follow up on a vein which plainly dips to the south and we abruptly reach a point where the quartz is cut off by a vein with quartz which dips to the north; the
61 northerly dipping vein has been developed by a series of raises, from 488 in a westerly direction, for about four hundred feet to a raise marked 7-A by raises which are marked 2-A, 4-A, 5-A, 6-A and 7-A. There we have a series of raises dipping to the north and extending to the south, above the top of the West End south dipping vein; they have been driven up upon plain vein filling quartz, usually of little commercial value, although in places there is rich ore.

Q. In place?

A. In place in the raises.

Q. Has it the appearance of being ore in place as distinguished from what is called drag ore?

A. It is ore deposited in the fissure in the place it is now found; there is the appearance in many instances of what has been termed drag ore, and by that I mean ore which is not in place where it was originally deposited, but which has been moved from that place by the faulting; the quartz by this movement is naturally broken, often rounded.

Q. Is that true of these raises?

A. That is true in many places, not only in the mine wherever these faults occur; it is true that you are liable to find some of this drag ore; in these raises there is near the bottom of the raises, near the top of the two veins,—especially near the top of the south dipping vein—some of this broken quartz which is drag ore, but as you go up the raises and get away from this line of faulting the ore is solidly in place where it has been deposited; it is banded in many

places filling the fissures; by that I mean lying in distinct layers; especially is that true in the first raise, 488. The most easterly raise, No. 569, has been extended under this upper portion of the north dipping vein in many cases by flat raises which dip slightly to the north; in section 569, raise 537, where I now hold my
62 pointer, shows this condition, so that you can pass upward from the south dipping vein, come up in quartz and meet quartz, similar quartz, in a series of workings flatly dipping towards the north. You would follow from the vein quartz of the south dipping vein into the vein quartz of the north dipping vein without interruption; there is the appearance of passing from one vein, of following one vein continuously in those workings. This is largely due to the fact that we have here what has been called a replacement vein. By that I mean that the original fissure through which doubtless the mineralizing solutions came, has been materially enlarged by dissolving the adjacent country rock, and replacing it with quartz. The hanging walls of both these veins are fairly well defined, in many cases smooth and very well defined. The foot wall is rarely well defined; the replacement has extended largely from the fissures along the hanging wall into the foot wall; there has been besides the fissuring in the two directions a fissuring of the under-lying ground beneath the top of the two fissures, often in a direction directly opposite to that in the veins; that is, when the strike of the vein is easterly and westerly, the direction of these fissures beneath their tops are northerly and southerly; this fissuring which extends from the hanging wall of the northerly dipping vein often extends downward to a considerable distance; in some cases as much as one hundred feet away from the top of the vein, and large bodies of quartz are found beneath the summit, if I may use that term, of the two veins.

63 The result of that is, necessarily, that mine workings can be made following up upon the true dip, of one vein, and at any point within a reasonable distance of the summit beneath the two veins a working can be made in almost any direction in quartz. It can go up or it can go down. But at some point it will reach the hanging wall portion or the true vein which dips towards the north so that we have continuous working from one vein in quartz, a more or less horizontal working in quartz, and another working dipping in the opposite direction, all in quartz, all in veins.

There is another working known as 571 only about 25 feet to the west of the raise known as the 573. It is merely a duplication of the work following the West End south vein up to its top beneath the northerly dipping vein.

We have another working known as 573, another one known as 575, and a very complicated condition from this point toward the west.

Mr. Dickson:

(Q.) Which point?

A. From this point at 575 towards the west, due to the fact that

the sili-fication and mineralization beneath the two veins is especially prominent at that point, and there has been stopes made upon both of the veins, through this section.

As a general proposition in this eastern end of the mine the stopes are confined to the West End, the south dipping vein. There are no stopes in the north dipping vein in this section. It has a much poorer and very inferior vein indeed in this section as com-
64 pared with the main West End south dipping vein. But there are a few stopes near the top, and of course, as we go further to the west in this north dipping vein, there are large stopes. But in the portion towards the east end of the claim, one of the marked differences of these two veins is that the West End contains large bodies of ore, and so far as developed the north dipping vein is barren.

Q. It is barren for commercial purpose?

A. It has no ore which would pay. The north dipping has followed up in these raises from 488 to 7 A has not in every case been followed to its upward termination. For instance, 488 shown by the green coloring, the cap, and we know that the vein does not extend into the cap, but the lower line of this cap has an extremely irregular, warped surface, corresponding, doubtless, to what was the surface of the ground ages ago, when this eruptive rock came over it probably as irregular a surface as would be formed to-day if there were now a volcanic eruption and the surface buried beneath it.

In one of the raises, five A, for instance, we find however, after going up about 70 feet, we reach a point where there has been a slight faulting and the vein there is terminated by the cap. So that in that case, we have the real apex of the north dipping vein. The real apex of the south dipping vein, as I see it, is the termination of that vein beneath the north dipping vein, and the fact that the north dipping vein continues uninterruptedly above this apex necessitates, in my opinion, the belief that they are separate and distinct veins.

As we go way to the west, the western end of the claim, we
65 have a somewhat different condition. We have a stope such as is shown on Section D of Exhibit G on the cross section, which comes up — evidently good bodies of ore have been extracted on the north dipping vein, the MacNamara vein. And in doing that development, they reached a point where the stopes themselves turned and dipped in a northerly direction.

Mr. Lindley:

(Q.) Northerly?

A. In a southerly direction. If there were no developments in this mine except this stope, without the raises which have recently been made above it, I would candidly be of the opinion that this stope was upon one vein, and that it had turned from its northerly dip to a southerly dip. It is an instance, which we often meet, where limited development does not prove the facts; where extended development is often necessary to determine real conditions.

At this point there is a raise called A. That is a recent develop-

ment, and it shows a similar condition existing in this portion of the mine to that in the eastern portion, as shown by the 2 A to the 7 A raise. That is a fact that while the stope strongly indicated before this raise was made the turning of the vein, this raise A has shown that the northerly dipping vein does, in reality, continue above the southerly dipping vein, and instead of being one vein that they are separate and distinct. It necessarily follows that if two veins run toward each other, either on a level or on a dip, that at some point they must meet. And this is the exact spot where the walls of these two veins meet, that is, the wal- near the hanging wall of the southerly dipping vein meets the northerly dipping vein, not at its
66 highest point, as shown by raise A, but at a point beneath so that we have one continuous stope, in my judgment.

Mr. Dickson:

(Q.) What have you in that raise A?

A. Raise A follows up upon a body of quartz, not as good quartz as in the stopes below. The quartz having some values but not paying ore. Possibly the nature of the filling in these raises I could illustrate by just a few samples.

The sample of quartz marked "I W" which I now show, came from the most eastern of what we termed the "A" raises. That is raise 2 A at a point 66 feet from its bottom. That is, at a point 66 feet above the leading point of the southerly and northerly dipping raise. It is quartz, not rich ore, but contains some black silver sulphides which give it an appreciable value.

Q. Mr. Wiley, are they marked on the rock itself?

A. They are marked with numbers which I will mention. The next sample, marked "2 W" came from raise 4 A. There is no raise 3 A. These numbers were doubtless given with the idea that there might be an intervening raise. So that raise 4 A is the next raise to the west of 2 A. It came from a point 35 feet agove the bottom of the raise, about the point marked where the letter A upon that raise occurs. This is a sample showing argentite or silver sulphide through the quartz, and is rich ore.

Q. I will ask you if both of those samples which you have already presented were taken from rock in place within the deposit?

A. They were taken by myself from the points indicated in these raises from rock in place. Sample No. 3 W came from the
67 next raise to the west.

Q. Give the number, will you, please?

A. That is 5 A. From a point 54 feet above the bottom of the raise. It is quartz with some mineralization through it, but is not good ore. Samples No. 4 W came from raise 8 in the western part of the mine, above the MacNamara stope. From a point 23 feet up that raise. It shows the quartz in that section. It is not ore.

Q. These last two, also, were taken from rock in place?

A. All of these samples are from rock in place in the raises at the point indicated. The vein filling, as deposited in that vein, and at the heights mentioned above the bottom of those raises. These sam-

ples—not these by themselves, but in connection with the observed conditions in the ground—show that there is a strong vein continuing upward and over the top of the southerly dipping vein, and that is is the upper continuation of the northerly dipping vein. There are a number of complications——

Q. Before you leave the raises, Mr. Wiley, I invite your attention to what I take to be a raise in the working shown upon this Exhibit A somewhat easterly of the east end line of the West End claim. Have you anything to say about that? Have you been up that?

A. I have. In connection with that, I will explain that the stopes, as the model plainly shows, which have a dip to the south on the main West End vein, as we go to the easterly of the east end of the West End claim into the ground of the Tonopah Mining Company, have a rather peculiar dip. They dip in an easterly direction similar to that of the West End, but also—in a southerly direc-
68 tion similar to that of the stopes of the West End, but they also are apparently turned up, that is, they have a dip towards the west as well as towards the south. There is a fault, I believe, it has been termed the Buried fault, which has interrupted the continuity of those stopes to the east, and at a point still farther to the east and at a higher elevation, we find another stope of the Tonopah Mining Company, now being worked, where we have a stope of considerable size.

Q. Now, Mr. Wiley, that last stope, the one you are now referring to, I will have you initial that in some way.

A. It is at the easterly end of what is marked the 500 level. And the most easterly stope shown upon the entire model. This stope follows a vein upward, having an inclination of some 25 degrees to the south, and a raise has been put up through the overlying trachyte, and at a point higher up on the 400 level of the Tonopah Mining Company there has been drifts run, cutting other veins, which are colored yellow; colored yellow because they have a northerly dip only instead of one vein we have two. In fact, another small one which might make a third. But one of these veins, that which lies farthest to the north, is the largest and strongest vein. It is now being worked and has been developed upon its dip upward for a distance of over 90 feet. This northerly dipping vein is plainly at a higher elevation that the southerly dipping vein, which I believe corresponds to the West End southerly dipping vein, only at a higher elevation, due, doubtless, to the faulting. There we have a more pronounced evidence of the fact, which is shown in the A raises; that is, the fact that the northerly dipping veins extend upward,
69 as they come toward the surface, toward the overlying cap and are at a considerable distance above the tops of the West End vein. The exact top, it is true, of this southerly dipping vein in the Tonopah Mining Company's ground is not determined. It is not developed.

Q. At that place? At the place you now speak of?

A. The top of the stopes is still in ore, and the vein extends higher up than is shown on the model. But it would have to make an extremely abrupt change to ever reach a point, as high as the top of the

northerly dipping vein. And we know that it does not make this abrupt change and come up there because the entire country is cross cut by the cross cut raise through the country rock, trachyte, and by the cross cuts upon the 400 level. So that the top of the Tonopah Mining Company's vein, as developed by this stope, if it extends upward is at some point beneath the 400 level, and therefore at a distance of at least 90 feet, and maybe a great deal more beneath the highest point of the north dipping vein. Now, I spoke of other complications.

Q. Before you go to that, just a question or two here; have you formed an opinion, Mr. Wiley, and what is your opinion, as to whether or not the most easterly stope shown on this model just east of the east end line of the West End is a stope in the same vein as the next stope in red to the west of it, which is shown upon the model at a lower elevation?

A. I believe it to be upon the same vein. I don't know. There is a considerable displacement between the two, but my belief is based upon the fact that it is similar in appearance, and it
70 is the only vein having this dip and direction, and the presence of the fault between the two would easily account for this displacement.

Q. This portion of the work shown on the model has no number or letters here.

A. It is marked 400 level.

Q. Well, that portion of what is marked 400 level is yellow, as I now point, there should be some lettering on it, is that approximately with the strike or diagonal with the strike of what you call the north dipping vein?

A. It is about a north dipping vein. I would not say for certainty that it is upon the same north dipping vein, as shown in the yellow lower down.

Q. And immediately to the west?

A. Yes.

Q. Does that line of work shown in yellow there east of the east end line of the West End claim, whatever vein it may be on, it is driven along the strike of the vein, or not?

A. It is driven along the strike of a northerly dipping vein.

Q. What is your opinion, if you have one, as to whether that is the same north dipping vein, or a part of the same north dipping vein that you have to the west and at the east end line of the West End claim?

A. I feel confident that one of the two northern veins, as shown upon this 400 level, is identical with the main northerly dipping vein called the MacNamara vein. But both, no matter which is correlated with it, is at a much higher elevation and could by no possibility make a fold and bend over and dip in the opposite direction as shown by the red stope.

71 Q. Go ahead.

A. There is a complexity shown at the eastern end of this model by the fact that not only there are numerous cross cuts running out into the hanging wall, but that there is a second series of

red stopes and drifts lying into the hanging wall of the West End vein. These stopes are upon what is called the Fraction vein. The Fraction vein is a branch vein of the main vein, and therefore is naturally given the same coloring. They are two separate and distinct veins in the upper portion of the mine, but on their descent into the earth, they unite and form one and the same vein so that they are given the same red coloring.

This condition is shown possibly clearer upon the cross sections A and B: A being a cross section just to the east of the eastern end line of the West End claim, and B being a cross section just to the west.

In this connection, I would like to say that these cross sections, A, B, C, and D have been made to supplement the information shown upon the model.

Necessarily, the model can show the formation of the workings only, but in that respect it is the best thing, if there were only one, to show the conditions in the ground. But in the solid rock which has not been excavated, the cross sections more clearly will show the continuity as assumed, we will say—to use that term—between workings. By that, I mean that if we have a drift upon a vein at a certain elevation, the cross section may connect that drift by a red line with a drift below, although there is not a working directly connecting those points. In selecting the place for these cross sections, they
72 were located at those points where there were the most workings. They are not taken through any arbitrary direction, nor at any arbitrary distances. Instead of taking one through this central section where there is little development in depth, they were taken, three of them—two of them near the east end. One through the McQuiilan shaft, and another one through the western end where there is almost continuous development on both of the veins.

The direction of the cross sections is substantially that of the dip of the veins, but not exactly. It would be impossible to make one which was upon the dip, because the dip changes especially as we have two veins which have different strikes and we could not make a line at right angles throughtout with those strikes.

Mr. Lindley:

Q. Which two veins have you reference to?

A. The northerly dipping and the southerly dipping, and also the third, the Fraction here. Section A, which is——

The Court: Mr. Wiley, we will take a recess now. This case is continued for fifteen minutes.

Mr. Bailiff, you may declare a recess of Court for that length of time.

(Recess of 15 minutes taken.)

73 The Court: Jim Butler Tonopah Mining Company, a corporation, Plaintiff vs. West End Consolidated Mining Company a corporation, Defendant.

WALTER H. WILIE on the stand for further direct examination by Mr. Dickson:

Mr. Dickson:

Q. Just proceed Mr. Wilie?

A. I was endeavoring to explain the reason for making the four cross sections.

The Court:

Q. Before proceeding will you please state the place crossed by section A and Section B. I think perhaps that was a little confused when you first stated it.

A. I will state it and show upon the model. Cross section A on Exhibit G is taken a little east of the east end line of the West End claim, it is a different section from the other in this way that it is made through a broken line and for this reason it is made through the long cross-cut of the Tonopah Mining Company, where I now lay my pointer, and at a point shown upon all of the plan maps. These lines are marked upon all of the individual level maps, B. C, D, E, & F; all of the lines of cross sections are plainly marked upon these plan maps. This is met at a point nearly above the head of what is known as the Jim Butler winze, for the reason that there is a continuous working going down on the dip of the West End Vein, and it was the desire to show this working upon the map, because by showing this we showed more continuous and complete workings. Section-B cross section B is taken at a point of varying distance from cross section A where I now lay my pointer, because the stopes upon the West End vein are continuous and there are more workings and it is substantially a true dip, or at right angles to the vein.

74 Q. What is its relation to the West End east line?

A. It is taken at a point about one hundred feet west of the east end line of the West End claim.

Mr. Dickson: Turn to the map the level sheets upon which is shown the plane of the sections?

A. Taking the six hundred level and all the other maps are the same, except section A & B are not shown on the two and three hundred, because there are no workings in that area, that being entirely in the cap; but on all the others the line of section are shown by the black broken lines, and are marked on all the exhibits from D, E, F, & G.

Q. Now how far east of the east line of the West End was section A. passed through?

A. Section A. is through a plane parallel to the east end-line of the West end claim, fifteen feet easterly of that line. Section B.——

Mr. Lindley:

Q. One moment, is it parallel throughout?

A. It is parallel throughout the entire width of the West End claim, and at a point above the Jim Butler winze it makes a turn following the line of the winze. Section B. is not parallel to the

line; where it crosses the northerly side line of the claim, it is at a distance of sixty feet.

The Court:

Q. Well that would be the southerly,——

A. Westerly from the northerly side line,—no on the southerly. I can give that better. It is at a distance of sixty feet west of the north east corner of the Eureka claim; that is not drawn as far north as the northerly end line, because there are no workings on this level; on the other map it will be drawn farther to the north; the position of section C, and section D. are plainly shown upon the plan maps; Section C intersects the southerly side line of the West End claim at a distance of two hundred and seventy feet west of the southeast corner of the West End claim. Section D. intersects the same southerly side line of the claim at a distance of
370 feet northeast of the S. W. corner of the claim. Now
75 a word as to projections, the manner of showing them. These workings as shown upon the model are extremely irregular. It is rare that they are the same, mathametical plane, and in order to make the illustration at all complete it is necessary to represent some workings which are not actually cut by the plane of the sections. Take an extreme case Section C, as shown and raise 2-A, and it shows raise 422-A, which is upon the Fraction vein; the position of these workings relative to the line of sections can be seen upon the model. My pointer,—this section cuts through the McQuillan shaft, that was one reason for selecting it, because it had a continuous development from the surface to the base of the model and deeper. My pointer is now lying upon it; it intersects the bottom of winze 422, but as the raise ascends the top of it gets a considerable distance east of the plane of the section, so to follow that we would have had to incline the model. If we followed a mathematical rule of showing only workings actually as cut by the sections, these two raises which are upon the vein would show upon the cross sections simply by a little dot, and the cross sections would be extremely incomplete; there is absolutely nothing to my mind misleading in representing the thing in this way.

Mr. Lindley: The gentleman is making an argument evidently arising out of my cross examination of Mr. Richardson; I admit that you can't always put it all in, but I never raised the question that you had to absolutely adhere to that.

Mr. Dickson: I suggest, if your Honor please, this is not an argument by the witness, but an explanation merely.

A. My endeavor was merely to explain the relation of the cross sections, to the actual conditions in the ground and are the reasons for taking these points. The points were taken without
76 reference to geology. Section three of which I was just speaking, showing the divergency of raise 422-A upon the Fraction vein. Now while upon these cross sections or two veins, and the reason for coloring the Fraction vein and the West End

vein with red are apparent; they are distinctly seen, and they become one vein in depth, and the glancing upward of this one vein as clearly shows upon this cross-section. Section three illustrate the complexity, probably the greatest throw upon the fault in the mine. The precise throw on cross section C is unnoticed, and rather a deduction based upon observation, veins and faults, at the nearest line to the cross section; it is certain that the Fraction vein is faulty and approximately to the extent as shown; the raise 422-A, which is upon this vein is now being extended. Personally I have not seen the extreme top of that raise. I have been up it twice, but I have not been there within a few days and I cannot vouch personally for the extreme top.

Q. How far up should it be?

A. About seventy-five feet, but from there down follows the Fraction vein, and the Fraction vein was extending upward from the top at the time I saw it. Now the position on this cross section of the various formations; at the bottom of this map, Exhibit G, is a series of little rectangles with different colors the conventional signs marked with the colors used both upon the map and upon the model, the green, the dark green color being the Brougher dasite-cap and the lighter green the andesite-cap, and the brown the rhyolite. Then we have a square, a rectangle marked trachyte which is divided in the model, and in the lower portion of this there is a difference, not striking, not to be seen at a distance, but there are marks through them and it is marked glassy phase;
77 that is so marked because in the mine we find two varieties of trachyte, one which is termed glassy trachyte, having more or less distinct banding, both trachyte and therefor- the same coloring is used with this distinction; there are in places to be found the two kinds close together in the vein in one working, but as a rule the glassy trachyte will underlie the main portion of the trachyte body; the red is marked West End vein, south dip vein; the yellow north dip vein, and the blue lines are faults, so there is a record upon the map of the conventional signs that are used.

The lines upon this section A, the upper portion is not colored. We know that it is cap and we have reasons to suppose it goes down approximately to the top of the trachyte, but the mine is not developed in that immediate section, and it has not been colored; but speaking of this at the point where there are workings, the different formations are known, and the continuity between those positions is more or less conjecture, and it may vary considerably in places from the positions marked, because the line which represents the top of the trachyte or the bottom of the cap having been the original surface was extremely varied; perhaps section C. will show it more completely, because we have the McQuillan shaft; we have in that case the Brougher dacite lying further to the west; we have the brougher dacite in the shaft for a short distance represented by the green colors; we have the andesite represented by the yellow, below that we have the trachyte and under that the brown rhyolite, so that we have the four rocks, and if we take the glassy phase, we have the two varieties of trachyte but not five varieties

of rocks; these sections are taken at the different distances, and show not only the vein conditions, the country rock conditions; they show that the eastern end plane is in the trachyte and considerable glassy trachyte on——

[Page 78 of manuscript omitted in original transcript.]

79 Q. 482 and 484?

A. 417 and 484. That whatever vein it may be, and I fully believe it to be the same, as the raise is continuing upward above 484 it reaches the Brougher dasite, or rock which caps so far as we know from there to the surface; so at that point we have the highest point, or point which corresponds to the surface before the capping covered; that is shown upon the model where I now hold my pointer, and the gap of which I spoke as being more or less conjectured is the portion undeveloped between the head of these two raises.

Q. How are they indicated on the model?

A. These raises are all marked upon the model; on account of the red coloring for the geologist they are not so distinct as upon the sections. The raise is marked 417 on the model, and the upper raise is marked 484.

Mr. Lindley:

Q. Do you make any particular designation of that vein?

A. I call it the south or a south branch of the south vein.

Mr. Dickson:

Q. The south dipping vein?

A. Yes. There is another conjectural feature upon this cross section that I would like to mention, because it is not at all certain that in that particular it represents the conditions in the ground. The south vein which follows down that same fault at a point in raise 566, the large stopes are terminated abruptly by a fault.

Q. That is on section D?

A. That is on section D.

Mr. Lindley:

Q. There is a vein that has been discussed between the parties as the south vein occurring at the West End of the workings. Are you now speaking of the south vein, or is it the south dipping vein. I don't want to get them confused. Do you know?

80 A. I don't know of any vein called the south vein, except that the main west end vein has been called——

Q. There is a vein called between the parties in other transactions the south vein?

A. I don't know anything about it.

Q. Then you have no reference to it?

A. I have not.

Q. Very well.

A. I simply call this the south branch of the south vein.

Q. Can't you designate it as the X vein?

A. I can describe it by the workings here, so there will be no possible mistake. It is the vein developed by the 586 stope, winze 440, and raise 440.

Mr. Peck:

Q. What are you designating now Mr. Wiley?

A. I am speaking of this south branch which unites on its dip with the main west or south dipping vein, and which has its apex developed beneath the West End claim, its upward termination against the cap.

81 Mr. Alling:

(Q.) Sometimes called the hanging wall vein?

A. Well, I think that designation, south branch of the main vein certainly describes it.

Mr. Dickson:

(Q.) At the uppermost termination of the branch that you are speaking of, how far does it separate from the main south dipping vein?

A. Nearly or quite 50 feet. Now, I wanted to call attention to this conjectural feature, that the main south dipping vein of the West End in the stopes is terminated at one point in raise 66 by a fault. That the next place where we actually have that vein developed on the level is in cross cut 606, where a raise has been put up, which comes out into considerably higher elevation. Now, I think I should say that I have not seen the top of that raise. I tried to get up there twice, but the air was so bad I could not get in there.

Q. How far did you get?

A. I have been up raise 606 to a point where it is cut, and I have been up about 40 feet above the 600 level on the other branch. But the upper portion of that I have not seen. But there is a section in between which is purely conjectural. It may be higher up or lower down.

Q. What is the distance——

A. The distance horizontally is about 30 feet.

Q. Have you any opinion as to whether the lower portion is the same vein as the one that followed down?

A. Well, I believe that this represents the probable conditions. It represents them to the best of my opinion and belief, but I have no knowledge and belief as to the precise position of that inter-

82 vening section. I only know that there are two faults that have dislocated the vein.

Mr. Lindley: I will state Mr. Wiley isn't it the rule when you put projections on the map, to place dots there to show that they are projections, and not put them in solid?

A. That is often done, sir. When in connection with the sections we had a skeleton model which shows absolutely the positions I think that the map is better if instead of a dot you have a full line.

Especially I think that it is a clearer plainer representation to draw a full line.

Q. It simply confuses the projection with actual demonstration is all.

A. Not in the slightest when the section is accompanied by plan maps showing the lines, and by a model which shows the exact position of all of the works.

Mr. Dickson: If it will be any more satisfactory to the gentlemen on the other side, I will ask permission to introduce that to withdraw that map Exhibit G, and you can indicate on that to-night the amount of the projection wherever there has been any projections, and the direction where the projection took place, east to west or west to east, can you not?

The Witness: It can be marked you cannot very well erase those lines.

Mr. Lindley: The ambar-assment which flows from a situation of that kind is obvious. When the court decides this case he may overlook all about that situation and if his attention is not called to what is projected and what is actually demonstration——

Mr. Dickson: That is what I am asking him if he can illustrate on that map.

Mr. Lindley: It is a rule that I have always seen followed
83 to dot in the projection. It may be perfectly rational and perfectly reasonable, I do not criticise that at this time. I may have something to say about that later, but I made the suggestion on account of the confusing tendency at critical points. You may go on if there are not so many of them I do not think it is worth while, but I am going to ask leave of the court to take these cross-sections this evening and trace them, if counsel has any duplicates to give us.

Mr. Dickson: We have no duplicates, we hadn't the time. If it would be more satisfactory to you I can have Mr. Wiley, wherever there has been any projections to indicate on the map what was projected, and the distance it was projected and the direction.

Mr. Lindley: I do not think that you need do that at present. Now, pardon the interruption Mr. Wiley; you may proceed.

Mr. Dickson: Go ahead.

A. I think that covers the essential points. If you wish something further.

Q. What kind of a vein do you call this south dipping vein?

A. I call it a distinct fissure vein. It has been materially enlarged by replacement, especially replacement of the foot-wall.

Q. What evidence do you find in the south dipping vein from the westerly to the easterly end of an easterly and westerly fissure.

A. We find the fissure developed on its strike for a distance on some levels greater than a thousand feet. We find it developed on its dip for distances greater than eight hundred feet.

84 Q. And what about—withdraw that—what evidences do you have underground of easterly and westerly fissures in this north dipping vein?

A. We have that fissure not so plain, nor so strong as the south dipping fissure, but we have a plainly defined fissure developed by the several levels and raises, and in the western portion of the mine considerable amount of stoping.

Q. That portion of the north dipping vein, westerly portion where the large stopes are shown, state whether or no you find an easterly and westerly fissure?

A. Generally speaking easterly and westerly. The direction of these two fissures is neither of them easterly and westerly and they differ from each other considerably.

Q. The two lines of the fissure, I will ask if they are parallel in their course or if they convergem and if so in what direction are they converging?

A. They converge as they go towards the eastern end of the claim and meet—necessarily meet at a point just near the eastern end of the claim, just the same as the two fissures converge, they come upward and necessarily at some points touch each other.

Q. You spoke of the replacement of the country rock from each of these fissures to some extent, and where they form a junction and for some distance below the intervening foot-wall country of the two fissures, as I understand, has been replaced from one fissure to the other for a distance below the junction?

A. It has to a very considerable extent in places.

Q. Now, aside from that region near, and a short distance below the junction, apart from that, how far, within what limits, have you observed the replacement extend from the south dipping fissure which seems to be the stronger vein of the two?

85 A. The actual ore bodies and stopes have been replaced from the hanging-wall into the foot-wall for a distance of twenty or thirty feet; in a few places more. It is not only a replacement of the vein wall country rock, the actual ore deposited in this section.

Q. In other places how slight a distance has the inclination or replacement extended? How far?

A. The vein is quite irregular in thickness, and in places the vein action has extended back but a few feet.

Q. But has the process of replacement extended into the hanging wall in the south dipping fissure to any extent?

A. Not nearly to the extent to which it has extended into the foot-wall. There are places where the quartz does extend out to the hanging, but they are comparatively few.

Q. And limited in extend as compared with the replacement on the foot-wall side?

A. Quite limited.

Q. Is that also true of the north dipping vein, where you have the big stopes?

A. So far as I have seen them. I have not examined the north dipping vein stopes nearly so much as the south dipping. I have been through many places where they are caved, some of them are entirely closed.

Q. You spoke, Mr. Wiley, of places where the south dipping and

north dipping vein or fissures come together, of there being an abrupt change in the structure from the south dipping course to a north dipping course, will you point out some places where that is most noticeable, so that it can be examined by the experts on the other side, if they desire to examine it.

A. The most easterly raise of all, the nearest to the end line 569, shows that condition very clearly, the south dipping vein coming up at a pitch of around thirty degrees and meeting a sharp
86 plane dipping in the opposite direction, just as plain as the roof of a house dips in the opposite direction.

Q. What is the appearance of the hanging-wall of the north dipping vein at that point as to being smoothe or well defined or illy defined?

A. Well at that particular point the hanging-wall is not disclosed all the way.

Q. Well, can you point to any place where the south dipping and north dipping fissures unite and you have a difference in structure between the two, where you have the hanging-wall of the north dipping fissure disclosed?

A. I would not use the term unite, they meet.

Q. Well, that is what I mean.

A. But the hanging-wall of the south dipping fissure is not as plainly defined as the hanging wall of the north dipping vein. On the north dipping vein the hanging wall is entirely a different wall from that of the main south dipping vein. It is the rule that it is smoothe and well defined, and there is more or less clay often along that wall.

87 Q. More or less what?

A. Clay, a deposited clay, which is common in the south dipping vein, but not so common, as in the north dipping vein.

Q. What is your opinion, if you have reached a conclusion, as to the strike of the south dipping vein, and also of the north dipping vein?

A. The strike of the two veins is best shown by the plan maps of the different levels.

Mr. Lindley: You are speaking of the strike at the top, at what you call the apex on any given level?

Mr. Dickson:

Q. Well, I will say on the 400 and 500 levels, where there is the greatest extent of development in the vein, as I understand. What level is that you have now before you?

A. The 400 level here. The 500 I wish to show it on.

Q. Exhibit what?

A. The 400 level, Exhibit D, shows by the red coloring the south dipping veins. The wider area is upon the main or West End south dipping vein. The irregular, smaller vein to the south is the Fraction vein.

Q. Give some station or marks that are on the map on that Fraction vein.

A. The Fraction vein is marked upon this exhibit, "Fraction vein" and extends through drift 422 W. and 422 N. and drift 422 S.

Q. For what distances is the main south dipping vein, as you call it, easterly and westerly developed on that level?

A. Over 1200 feet.

Q. How much?

A. For a distance greater than 1200 feet. I should like
88 to speak and call attention to the fact, in connection with this, that the apparent splitting, division of the two veins toward the west is also shown upon this. The southern red streak being what I term the south branch of the south vein.

Q. Now, leaving out the south branch of the south dipping vein, a distance,——

A. The distance is greater than 1,200 feet, not including that branch.

Q. Now, I point to the red portion, what is shown in red on this exhibit; that represents the ground being stoped out, I suppose?

A. Not all of it, no. There are stopes through that area but the red coloring upon the plan map is not confined to the stopes.

Q. Has the vein anywhere a width or thickness such as would appear from that picture?

A. It is as shown upon the plan. That is not the true width at right angles to the dip of the vein, and being a very flat vein, the width on the horizontal projection is very considerably magnified.

Q. Now, go to the 500 level. Is the Fraction vein indicated upon that level also?

A. The development upon this level in the Jim Butler mine in the Fraction vein is shown upon this level.

Q. How is it marked?

A. It is marked by the words "Fraction Vein." This particular level also shows very plainly some of the faults, a stepfault which interrupts the continuity of the Fraction vein on the level.

89 Q. You spoke of that as the south branch of the south dipping vein; that is not developed on that level, is it?

A. It is not shown upon this plan map, although it is developed on this level, but at that level it unites with the other vein so that there is only one red streak, necessarily.

Q. Now, go back to the 500; to what extent, in a general easterly and westerly course is the south dipping vein developed on that one level?

A. The extreme distance between the eastern end of the south dipping, vein, as disclosed by the Tonopah Mining Company's stopes, and the extreme western end where it is cut off by the Broughe dacite, even at this depth, is over 1,400 feet. There are interruptions in the continuity, that is, it is broken by the faults. I do not want to have the impression conveyed that it is an uninterrupted, straight vein for 1,400 feet.

Q. Well, where there is any interruption by faulting or otherwise, it is not represented on that exhibit as being continuous, is it?

A. The dislocations by the faults are all shown, where they are of any magnitude, upon this map.

Q. Have you formed an opinion as to whether or no for the distance you have stated that is one vein on that level?

A. It is one vein, or portions of one vein from the extreme eastern to the extreme western ends of the red coloring shown upon this map. The direction of the north dipping vein is best shown upon the plan of the 400. And the divergence in direction of the two is plainly shown upon this map; a difference of about nearly 40 degrees in direction.

90 Mr. Lindley:

Q. What level is that?

A. This is the 400 level. The red coloring upon this map is interrupted also by a fault. The yellow coloring upon this plan of the 400 level is shown as terminating for a distance to the north and to the west. That is due to the interruption by what has been termed the Edwards fault. The vein continues beyond that but, like the south branch, it is interrupted by these faults.

Q. Now, do I understand that on the 400 level, the north dipping vein and the south dipping vein on their course easterly come together?

A. The two veins meet at that point. Necessarily, having a different direction, they meet at some point, and that is the point as shown by the colorings near the east end of the West End claim.

Q. Now, has the vein from there on easterly been developed on that level for any distance?

A. It has been developed only to the extent that is shown upon the model by the work farther to the east in the Tonopath Mining Company ground.

Q. Have you reached a conclusion, Mr. Wylie, as to what is the top or apex of what we have been speaking of, or you have been speaking of, as the south dipping vein?

A. I have.

Q. I wish you would state what your conclusion in that regard is.

A. The apex of the south dipping or main West End vein crosses the eastern end line of the West End claim. This apex is at a considerable distance beneath the surface, due to the fact that all these veins are covered by capping. This apex extends in a west-
91 erly direction beneath the surface of the West End claim for a distance of about 1142 feet, at which distance it crosses the northern sideline of the West End claim into the MacNamara claim. This line is not a mathematical line. It is irregular and broken in places by the faults, as well as by the fact that the cap which came down was not upon a regular descending line. The original erosion surface was an irregular plane. This top in places is beneath this cap, and to a considerable extent, it is beneath the surface or plane of another vein, which dips in a directly opposite direction and extends upward above the summit or top or highest point of the West End south dipping vein.

Q. The other vein that you now refer to is the one that you have been referring heretofore as the north dipping vein?

A. It is. The strike of this south dipping vein is shown by the

levels upon the vein, and is shown to be essentially in an easterly and westerly direction, approximately parallel to the West End claim.

The dip, of the vein is, of course, at right angles to this strike. The true dip, as we go downwards upon the vein being approximately in a southerly direction, more or less parallel to the end lines of the West End claim.

Q. I will ask you whether or not you, among others, directed the coloring that was to be put upon the model to represent different geological features, as well as vein features, and also upon the several maps that have been referred to?

A. The coloring upon all the exhibits was the consensus of opinion of the different persons, and I assisted in suggesting with the others, what colors to use, and assisted in directing what colors should
92 be put upon the different workings to represent the formations which I had seen in those workings.

Q. Do you approve of the coloring that has been adopted to show the different geological features and vein features on all these exhibits?

A. I do.

Q. I thought Mr. Richardson knew more about geology than he does. So I will have you take that model, the maps being the same color scheme that is there, and state what the different colors shown upon the model are intended to represent. You have already spoken of the cap rock, the green and the light green?

A. I think I have mentioned them all, but to repeat, the violet color is trac-ite; the dark brown color is rhyolite; the red coloring represents the south dipping veins or their branches; the yellow color is the north dipping veins; the two greens are the two different cap rocks.

Q. And the blue?

A. The blue shows faults.

Q. Now, I notice particularly on the northerly portion of the workings shown upon this model another color, gray,—I take it to be gray. What is that?

A. The gray or neutral color is where the geology is not put on at all. It represents nothing. In many cases the workings were inaccessible; some of them were beyond the lines and were not accessible.

Q. During your examination or examinations of the underground workings shown upon this model, I will ask you if you visited all of the underground workings that were accessible?

A. I think I have visited all which were accessible. If I
93 have omitted any, it was inadvertence. It is possible there are some, in fact, it is probable some small workings that have been missed or some that I did not get into, especially in the MacNamara, where I tried to get in and found it caved and I might have gotten in in some other way.

Q. But your aim and purpose was to visit all of the openings that were accessible.

A. I have tried to.

Mr. Dickson: If your Honor please, there are a few more questions, perhaps; I do not want to close.

The Witness: I think I should say in connection with that answer that I approve all the coloring upon this model, that there are a few, a very few workings where I don't know. This model has been colored, as I stated, by different persons and there are a few workings I have not personally been in. That is, they are caved and I could not get in, and yet they are colored. For instance, this raise up here is entirely closed (indicating).

Q. Which raise?

A. This raise above the MacNamara stope has no number, but it is directly north of the Porcupine shaft, colored green at the top. That is caved in and I understand has been caved for years, but it is colored on information and knowledge of others.

Q. What other places are there that are colored there that you have not been able to gain access to?

A. Well, the Porcupine shaft, I haven't been there. I have seen it at the top, and I have seen it at these two levels; I have never been entirely through it.

94 Q. Well, are we to understand then that the coloring upon that map—I will change that question. Are we to understand that there are a few places colored, the red or yellow or purple or dark brown which you have not had access to?

A. Yes, a very few.

Q. What is the——

A. There is only one other place I have not spoken of that I might call attention to. This long working on the 300 level is rather interesting. As it runs out from the stopes upon the south dipping vein through the volcanic Brougher dacite to a point where it meets the trachyte underlying vein, the *and* there, on what is known as the California stopes there are workings upon the north dipping vein, which, as we come up on the true dip at right angles to the strike, hit this Brougher dacite and have their top, their highest point, beneath this cap. And there is no south dipping vein at all in that area because of the cap being deep down and extending even as low as the 600 level.

In other words, this area which upon the surface is shown by this slope, is the beginning of Brougher Mountain or volcano extending up, and these workings run into the eruptive rock of the volcano, and there is no vein on the south dipping part; it is cut off much sooner than upon the north dipping part.

Q. Cut off farther to the east?

A. Much sooner as we go toward the west, yes.

Q. Is it your opinion that the termination of this north and south dipping vein is due to that eruptive rock?

A. It is unquestionably due to the Mt. Brougher volcanic eruption.

95 Mr. Lindley: Let me understand that question.

Mr. Dickson: Whether, in his opinion, the cessation of

these two veins is due to the fact that it was cut up by this eruptive rock.

Mr. Lindley: I guess that is obvious.

The Witness: Not only the termination of the vein on its strike is due to that, but the termination of the northerly dipping vein as you go upward upon its dip is also, in places, due to that.

Mr. Lindley:

Q. As an intrusion?

A. Perhaps the term intrusion is correct, but still it is a vast upwelling of the volcano doubtless Brougher Mountain, so that it is of greater magnitude than the ordinary intrusion.

Mr. Dickson:

Q. What is your opinion, Mr. Wylie, as to whether that intrusion or eruption, eruptive rock, has been post-mineral or pre-mineral?

A. It came after the vein, as proved by the fact that the vein terminates and is cut off, and as we drive drifts we go from the ore bodies or from the veins directly into the eruptive rock.

Mr. Lindley:

Q. I would like to ask in reference to this nomenclature, the naming of these rocks. Have you any other name for the Brougher dacite? Has it any other local name by which it is called?

A. I know of none, except the cap, and in as much as the andicite under it is also cap, we, to be explicit and complete, call it the Brougher dacite cap.

Q. Are you familiar with the names given to the rocks in Spurr's monograph?

96 A. I am not familiar. I have read a portion of that.

Q. I simply want to identify those rocks, if I can.

Mr. Dickson: Which names do you refer to, Mr. Lindley? I understand he has given more than one.

Mr. Lindley: Take his last report.

The Witness: The U. S. Geological report, Mr. Lindley, does not use these names which we have used, but I have seen a report, second report of Mr. Spurr's, a part at least of that report, in which he entirely changes the names of the rocks as originally given. And I think that these names agree substantially with the revised edition, the last one by Mr. Spurr, made in 1910.

Q. What rocks do you identify as the Fraction dacite breccia?

A. I think it is the Brougher—Oh, the Fraction dacite. I don't know. The Brougher Mountain dacite.

Q. You do not know whether that classification would bring it within the Brougher Mountain dacite or not?

A. No, I don't know.

Mr. Dickson: I would like to adjourn now, if your Honor please. We are getting along pretty rapidly and I am going to try to speed it as much as possible, and if we could shorten the hours a little,—it is hard work for me; I am getting old.

The Court: Any objection? This case is continued until tomorrow morning at 10 o'clock.

97 3.

December 9th, 1914—ten o'clock a. m.

Testimony of WALTER H. WILEY, resumed.

Direct examination:

Mr. Dickson: You may proceed with the cross examination Mr. Lindley.

Cross-examination.

Mr. Lindley:

Q. Mr. Wilie, as a preliminary to your cross examination upon some of the issues of this case, I would like to straighten out in my own mind your conception of the order of the occurrence of these various rocks and I would like you now to take them in the ascending scale, take the first appearance now under consideration no matter what may be below that. What is the earliest rock that is encountered in this territory; of the earliest geological period?

A. The deepest rock in the ground is the rhyolite.

Q. What relation has the rhyolite, if any, to the vein system?

A. The rhyolite lies in the foot-fall country of the,—well of both veins beneath the veins.

Q. Is that rhyolite the rhyolite that is familiarly called the West End rhyolite?

98 A. It is so termed.

Q. That forms the foot-wall of the vein?

A. In some places.

Q. Does it form the hanging wall in any place?

A. I do not recall seeing it on the hanging-wall side at any point.

Q. Then it is the foot, or forms the foot of the vein country?

A. In places only.

Q. Well, there is a change of formation?

A. There is.

Q. This comes through. Now proceed to the next rock? Your conceptions of this situation was that the rock first laid down so far as this controversy is concerned was the West End rhyolite?

A. It is the deepest rock. Of course the trachyte is found, as deep in other portions, more especially to the east, and I presume that the trachyte was first formed, although I do not know for certain.

Mr. Dickson: The trachyte?

A. The rhyolite was formed first.

Mr. Lindley:

Q. Then what happened?

A. Right above that in many places and at the same elevation, at other levels is the trachyte.

Q. That is second in point of time and overlying the rhyolite.

A. That would be the natural assumption, although not an absolute conclusion.

Q. What is your judgment about it?

A. I really am not enough of a geologist to say. I usually would suppose that the deepest rock came there first, but I understand that in Tonopah that this is sometimes, often in fact, not the case.

Q. This trachyte, which you speak of and according to your belief or judgment is second in period of geological time, is of volcanic flow; that is discharged from a crater of a volcano over-
99 flowing the underlying rhyolite.

A. I do not know its source whether from the crater of a volcano or some large eruptive dyke of some distant source I only know that it is an eruptive rock; it may have come from the surface or may have been intrusive between rocks or andesite.

Q. Well, we have the trachyte then overlying the rhyolite?

A. In places, yes.

Q. To what extent *is* the area involved in this Jim Butler West End McNamara field does that trachyte overlie the rhyolite?

A. In the central section, perhaps a third or a quarter of the area of the length of the West End claim roughly speaking.

Q. Well, next in sequence what rocks do you encounter in the geological order in the ascending series?

A. Above these we have the caps, two different rocks; first what has been called the andesite cap and next on the surface what has been called the Brougher dacite cap.

Q. Is this andesite which you have reference to, frequently referred to as the Midway andesite?

A. I do not know.

Q. Is this classification of rocks in this district in the order of their appearance to which you have testified, have you reached this classification from your own investigation or have you accepted the classification fixed by others?

A. I have investigated myself as to the occurrence of the rock, but the names of the rock, candidly, I will say, personally I do not know whether this trachyte is a trachyte an andesite or some other rock. To determine that would necessitate investigation along the line of petrography, and I have accepted the names which I understand are the last revised names given to these rocks by others who are far more competent than I to name them.

100 Q. By others who do you mean?

A. More especially Mr. Spurr.

Q. Mr. Spurr. In his contributions to the work of the geological survey or upon his report of the mining properties here, or both?

A. I have studied both, but the names which he gives in his professional paper of the geological survey, are not the names which he gave later on in the report made in 1910 on the mines of the district, and the names which are used here agree with the last report.

Q. Well, were those a change in the names any more than a minute classification?

A. I think they were a distinct and extreme change of names.

101 Q. How about the character of the rock?

A. I do not assume the character has changed.

Q. Well I mean the designation?

A. The designation changed materially, yes sir.

Q. You know what is commonly termed the Fraction dacite or breccia in this term?

A. I have heard that term.

Q. And you know the horizon in which it lies?

A. No, I do not. I only know that term was *sued* by Mr. Spur originally for some of the top rocks.

Q. Well, do you identify that what we call the Fraction dacite breccia as being the equivalent in certain areas of what you classify as the Brougher Mountain dacite?

A. I think possibly that is so, although there is so much confusion in my mind as to just what was meant by that, and I am so entirely incompetent personally to give these names to these rocks that I should prefer to answer that I do not know.

Q. Well, I apprehend, Mr. Wiley, that the only purpose of correlating these different names is so that the different witnesses when testifying under different names may be known to be referring to the same thing; I do not understand that there is any particular point in the change of the names that changes the physical condition. You have given us the best that you can with reference to the origin of these rocks and the order of their occurrence?

A. I have.

Q. And the last is the Brougher Mountain dacite?

A. It is.

Q. Is that the rock that overlies the extreme west end of the West End claim?

102 A. It is.

Q. I am going to proceed with this examination, adopting you- theory for the time being for the cross examination, the theory that you have that these two veins terminate abruptly up against something.

A. They do.

Q. What do they terminate against?

A. Against this Brougher Mountain dacite cap.

Q. And nothing is seen of them in that direction any more?

A. Nothing whatever.

Q. With reference to the order of laying down of these rocks when were the veins formed?

A. The veins, I presume, were formed before either of the two cap rocks and after the other rocks.

Q. That is the forming of the trachyte or Brougher Mountain dacite?

A. Before the andesite or dacite, and after the rhyolite and trachyte.

Q. After the rhyolite and trachyte. Aand to some extent, these veins, do you classify them as fissure veins?

A. I do, with the explanation that they have been very materially enlarged afterwards by the replacement of the walls.

Q. That is to say, the mineralization has come afterwards?
A. Yes.
Q. The vein itself has been enlarged?
A. Yes.
Q. In what way?
A. By replacing the walls with quartz from the previously existing fissures.
103 Q. In other words, the mineralization extended into the walls?
A. Yes sir.
Q. The mineralization extended into the walls and replaced the original rock?
A. Yes.
Q. So these veins are replacements?
A. They are replacement fissure veins.
Q. Now I understand you testified that both of these veins in places follow the contact between the two veins?
A. In places they do.
Q. Your idea is that this fissure was created by some dynamic force through some crater or crevice in the earth, regardlesss of the contact and regardless of the direction of the contact?
A. It is, speaking broadly; of course necessarily at times it was not regardless of the contact and in places it is.
Q. To what extent are these two veins found between the two rocks?
A. The south dipping vein, so far as I can say, is more often on the contact, between the rhyolite and trachyte although that may be due largely to the fact that the area of the south dipping vein — much larger than the area of the north dipping vein.
Q. Have you a cross section which shows the contact of the two veins existing in the line of contact?
A. Our cross section "C" of exhibit "G."
104 Q. Now referring to your section "C" we have the two veins there following the same contact?
A. We have the two veins with the rhyolite beneath both, and the trachyte forming the hanging-wall in each instance through the greater portion of the area shown on the section.
Q. Well in that section as it is delineated on that map the two veins occupy the same plane of contact between the underlying and overlying rocks?
A. They do, to the extent that the *extent that the* north vein lies beneath the south dipping vein. As the north vein extends on its course above the south dipping vein it is in trachyte entirely for a ways, above that we have the cap.
Q. It extends beyond the plane of the contact and breaks into the trachyte, that is, the norh dipping vein does?
A. It does.
Q. The south dipping vein adheres to the contact?
A. It does.
Q. Now with reference to the relative age of these two veins which is the older of the two?

A. I don't know for certain, but I know that there are strong indications that the north dipping vein came after the south dipping vein?

Q. Came after?

A. Yes.

Q. What would indicate the difference in time of appearance?

A. The fact that the north dipping vein continues up beyond the south dipping vein and has a smoothe wall continuously through the distance from a point below to a distance above that vein; and that the termination in some places of the south dipping vein is rather abrupt against that vein.

Mr. Dickson:

Q. Against the north vein?

A. Against the north dipping vein.

105 Mr. Lindley:

Q. And it is your idea that in the first instance the north dipping vein was created, the fissure was created and that subsequently some dynamic force created the south dipping vein?

A. There are indications of that.

Mr. Dickson: I understood the witness to say the converse of that, that the south dipping vein was first in time.

The Witness: That is correct.

Mr. Dickson: In the opinion of the witness.

Mr. Lindley:

Q. I intended to put it that way. Is it your idea that the south dipping vein was first formed. Let me before proceeding with that dynamic geology——

A. I want to say, Judge, that I have not stated that as a positive conviction. I have stated it as a probability, in my opinion only. I do not know for sure.

Q. Well, if it was cut off by the north dipping vein, it must have been there to be cut off?

A. There are indications that at those points, it must have been there before, yes.

Q. Then it is your idea, that is to say that you are not going to commit yourself as to that absolutely, I understand Mr. Wiley?

A. That is a very difficuly problem for an ordinary individual to determine.

Q. Well, I would like to ask you if, in your extended experience as you have detailed in here for the benefit of the court, the occurrence that you speak of here of this south dipping vein being cut off by a north dipping vein under the conditions shown here, is a matter of frequent occurrence?

A. Yes, th[illegible] not at all unusual.

Q. Not at all unusual.

A. For one vein to be cut off by another. Extremely common.

106 Q. I would like you to explain what there is to indicate at the point of contact of the two veins, eliminating for the time being the upper extention, to indicate that one is cut off by the other?

A. The fact that the change in dip in some of the raises is extremely abrupt. That as you come up on the south dipping vein for instance, in raise 569 the most easterly of the raises, the raise nearest the end line, you meet a sharp dipping plane in the opposite direction. A clear distinct sharp dipping plane which appears to have cut off the other vein.

Q. Appears to have cut off or appears to have changed the direction of the other vein?

A. In no way changed the direction of the other vein because, of course, I cannot altogether assume your hypothesis of eliminating the upward extention, because you see the upward extention right there. You see it going on above.

Q. That is you see it now?

A. As well as below.

Q. Let me ask you whether in mining that ground the miner has paid any attention to anything above the hanging-wall?

A. There is no pay ore there and the miner has paid no attention that is, he has extracted no ore from above the hanging-wall any more than he has on the north vein in this area below.

Q. As a matter of fact the miner has followed the ore in whichever way it has been?

A. Yes, doubtless endeavored to do so.

Q. When were these upraises which you identify on your model here, 2-A, 4-A, 5-A and 7-A put up?

A. Comparatively recently, I believe. I do not know exactly as some of them were there when I first saw the mine.

Q. Well, they are what you might call litigation work as contradistinguished to work in the immediate progress—in the
107 ordinary progress of developing a mine?

A. I understand that they have been made to determine the facts in the case geologically for the purposes of this suit.

Q. What do those up-raises follow?

A. The- follow upward on the north dipping vein.

Q. Are there any faults in that section of the country?

A. There are a great many faults in this mine.

Q. Well, can you classify them as major or minor faults?

A. Now, as a whole, although I spoke of one the Edwards fault as being one of the most extensive.

Q. Are there any major fault-, that is a controlling factor there that passes through that ground?

A. I don't know. The buried fault is certainly a fault of very considerable displacement; possibly a good deal more than the Edwards fault. But the Edwards fault has been traced for a longer distance a greater depth in this West End mine than any of the others.

Q. Is there any evidence of faulting in connection—where these raises extended?

A. There is evidences of movement, and that movement along the north vein itself.

Q. To what extent along the north vein, where? What part of the north vein?

A. The wall of the north vein has more clay than is usual on the wall of the south vein. Both of theses veins have been lines of faulting. It is the exception that a fissure vein is not more or less a line of faulting, and this leads to the formation of the most conspicuous feature, clay on the wall. There is clay on both of these veins, but there is more on the wall of the north vein than is usual on the wall of the south vein, therefore, I say that there are indications of movement in that immediate section where
108 those raises have been made.

Q. In other words the gouge has that movement?

A. It has.

Q. And do you find that gouge uniformly in the hanging-wall section of the north dipping vein?

A. I wouldn't say uniformly, but we find it over a considerable portion of the work.

Q. In the immediate vicinity of where you say this—where one vein ends and the other begins, is there indication of the gouge between the two veins where they come together?

A. Where the brittle quartz abuts against the britt-e quartz you cannot make a clay out of that and the quartz is crushed and broken without clay.

Q. In other words in the vein there isn't any gouge?

A. The gouge lays on the walls, the hanging-wall in almost every case above the vein.

Q. Well do these walls the foot and hanging of the south dipping and the foot and hanging of the north dipping, break into each other, or is there any line of demarcation, eliminating now out of consideration your raise above; anything to indicate that those two veins now occupy any different position than they originally occupied?

A. They occupy the same fissure which was enlarged by replacement. The amount of movement which may have been caused by this faulting may have been extremely slight in the case of either vein, and not a movement of the fissure vein, cnly local in places.

Q. Is there any drag quartz aroun*f* in that section?

A. There is some drag and rounded quartz.

Q. Where?

A. In both of the veins and where we have more clay there is more liable to be more of the drag quartz and near the head or the point of the meeting of the veins there is in places con-
109 siderable drag quartz. Still further above that there is the plain banded quartz deposited in place.

Q. Now, it is your idea if I understand you, that generally there was a fissuring along the plane of this contact?

A. Well, it happened locally to be there along the plane of the contact.

Q. Well, I am speaking now with reference to the geological section, section "C." This is the — before mineralization I suppose? That contact was created before mineralization?

A. The rocks were there before mineralization, yes.

Q. And the contact was there before mineralization?

A. Certainly, one rock lay on the other.

Q. One rock lay on the other. And that was a contemporaneous proposition? That is to say that contact was formed under the same conditions on both sides?

Mr. Dickson: You mean on both the south dipping and the north dipping vein?

Mr. Lindley: Yes.

A. Under the same conditions, yes.

Q. And that was there before mineralization?

A. It was.

Q. Now what is your theory as to the mineralization of the two veins?

A. The natural and logical one, that having the fissure there the mineral solutions came up through those two fissures and mineralized the two veins.

Q. Passed from one into the other?

A. No, not necessarily. Passed in some cases near head, yes, the mineralization after the second fissure was formed, if they were of different ages, from one into the other for a short distance, a sort of mingling in spots.

110 Q. But the fiss .e was all formed as you have testified to, at the same time, north dipping and south dipping.

A. No, I didn't testify to that. On the contrary I expressed the idea that probably the north dipping fissure was formed after the south.

Q. Well, the contact was formed simultaneously?

A. Certainly.

Q. And both veins follow the contact?

A. They do.

Q. Now with reference to the period of mineralization, and these openings were there *n*efore mineralization, along that contact?

A. Not necessarily above if one was formed after the other, presumably there was some mineralization in the first before the second was formed.

111 Q. Having your mind attracted to the fact of contact between the two rocks, and an opening, space on the plane of contact?

A. Oh, that I should not admit, that there is an open space on the plane of contact. That contact might have been a line of weakness, and doubtless was in this particular section, and accounts for the fissures following that contact. But there certainly was no open space on the line of contact until the fissures were created.

Q. Then, it is your idea that the south dipping vein formed along that contact first?

A. Very likely.

Q. And then the north dipping vein was formed along the same contact subsequently?

A. Along the same contact in parts.

Q. Is it your idea that the south dipping vein had any further upward extension at the time of the occurrence of the north——

A. Very possibly it had. That I don't know.

Q. That you don't know. Well, in order to create a fissure such as you have stated as observed here in the north dipping vein, it would require some considerable dynamic force?

A. It would.

Q. It would necessarily fault the original vein, the first vein?

A. Not necessarily fault it, no.

Q. Not necessarily?

A. Probably would.

Q. Probably would. Well, upon the probability, where would you say was the faulted segement of that vein?

112 A. That I don't know. The meeting point of these two veins, as you go up on them, is almost at the cap, and if there had been a segement of the south dipping vein which was faulted by the north dipping vein, and this segment was faulted to a higher elevation, it would necessarily have been entirely removed by the extensive erosion which doubtless preced- the overflow of the andesite cap. That is the reason I did not wish to express any positive convictions as to the previous existence of this faulted extension.

Q. Well, have you determined whether this fault, as you say there was a fault, was a normal fault or a reverse fault?

A. I have not.

Q. You have not made a very close study of the faults then, in this neighborhood?

A. Not an extremely close study, because the faults, as a rule, do not interrupt the continuity of the vein, and I have looked at this matter from the standpoint of the miner, who, if he can, follow his ore through a continuous stope, or a continuous working of any sort, pays minor attention to the faults.

Q. Yes, but you are not testifying as a practical miner. You are testifying as an expert from world wide experience.

A. I am endeavoring to testify as an experienced practical miner.

Q. Practical miner?

A. Yes. I have necessarily absorbed a little, endeavored at least to learn a little geology, but I am in no sense a geologist.

113 Q. Well, you are willing to rest the situation and your judgment upon your lack of knowledge of the existence of faults in this immediate section of the mine as to their character, the extent of the throw, and whether they are reverse or normal?

A. Well, I have simply stated that where the dislocation of the faults is apparently trivial, I have not entirely disregarded them. I have endeavored to determine whether the throw is trivial or not. Where I can follow from ore to ore, I have considered that they are of no special significance.

Q. As a matter of fact, you take a vein that is as massive as this

is, has a subsequent faulting a considerable influence on the vein structure?

A. If it dislocates the vein, it certainly has.

Q. Isn't there usually a considerable breaking up, fracturing of the enclosing rocks in the neighborhood of the vein?

A. Very often.

Q. Isn't that a common occurrence in veins of this massive character?

A. It is, as I say, very often.

Q. Very often, you find, then, fractures both in the hanging, which is the indication—which is interpreted as having been affected by dynamic force?

A. Yes.

Q. That is correct, is it not?

A. That is correct.

Q. So, that you have frequently in mines of this character, I assume, conditions which resemble masses of stringers putting out from either the foot or the hanging, or both, as a matter of
114 frequent occurrence?

A. No, on the contrary that is an extremely unusual occurrence. There are very few stringers putting out from the walls of any of the veins. There are a few branch veins of considerable extent.

Mr. Dickson:

(Q.) You are speaking of this territory?

A. I am speaking of the entire mine, yes. There are very few stringers, in deed.

Mr. Lindley:

(Q.) Well, I will take up that branch of the subject later. Upon what are all of these upraises extended? Are they extended along a fault plane? I say these upraises, I mean what you have not denominated as the litigation upraises?

A. They are extended along the plane of the north dipping vein, which is — a minor extent a fault plane, the same as the plane of the south dipping vein is also to a still lesser extent a fault plane.

Q. And you call it a fault plane; it lies on the contact between the two rocks?

A. Yes, if there had been movement—if there are indications of movement, I call it a fault plane.

Q. As a matter of fact, almost all fissuring is the result of faulting, is it not?

A. Almost all fissuring is accompanied by faulting.

Q. Now, how far in upward ex-ent from the levels to which these raises are extended can you follow what you call the north dipping vein in the upraises?

A. You can follow them to their tops, except for the interruption by the cap, with the explanation that in raise 5 A, which I believe
115 is the only one which has reached the real top, the top there, is a result of meeting the cap and also a line of faulting, an

added complication. And the upper portion of that raise, while it is in trachyte immediately beneath the cap, does not contain a vein.

Q. Are those veins that you say exist in those upraises cut off by the fault above at their tops, or at the tops of the upraises?

A. With the exception of this one, no.

Q. Do they have further upward extension?

A. Yes, they have. Probably not great, on account of the cap.

Q. Do they penetrate into the cap?

A. The cap shows above them in several instances.

Q. Well, the dynamic force that created that vein expended itself in that region, then, I suppose, in the upward direction?

A. Expended itself?

Q. Its force. In other words, there is no extension into the changed formation, the capping of this north vein?

A. Well, of course, if the capping came after the vein, there might have been a tremendous dynamic force, and it did not expend itself in the cap because the cap was not there.

Q. Then, it is your idea that this lay in the open air before that capping came out?

A. Not lay in the open air, but there doubtless was great erosion and the open air was somewhere, but doubtless much higher up; how much higher I would not say.

Q. At some time that was open air?

A. Sometime, some point above that doubtless reached the

116 surface, yes.

Q. The original geological surface is represented by the plane of contact of this later overflow, is it not?

A. The original surface of the ground at the time the overflow came, yes, certainly.

Q. In other words, where this later flow has come along and buried up these apexes, that was an original surface?

A. That was the surface at that time.

117 Q. Have you examined the upper end of those veins to any extent to determine whether or not there is any indication of their having a surface?

A. I have examined the upper end.

Q. What position would you naturally expect a vein that had at one time appeared at the surface, and where it was subsequently covered over by a strong flow—what condition of the vein would you expect to find, as indicating that it was a former surface?

A. Well, as a long interminable time has intervened, I do not know that you would expect to find the conditions which you find on the outcrop of the vein on the surface here.

Q. Why not?

A. The period of oxidization, if there was oxidization, and the conditions which existed many millions of years ago—I could not attempt to get at.

Q. Well, we judge of those appearances.

A. I think that it is entirely wrong to suppose that the climate of Tonopah is the same now as it was the many millions of years ago.

Q. Well, I judge from your testimony then that you do not find any oxidization on these veins?

A. I do not find any oxidization there.

Q. That is what I would imagine from your examination. Consequently if that was at one time the surface, subsequently covered up by this later flow of trachyte, there is no evidence on the ground now?

A. There is no evidence; there is some evidence in many cases; this cap line not only descends toward the east, but it descends also towards the south, and we have many times much deeper down where the cap actually reaches the vein, we find a similar appearance in those places as regards oxidization; I do not mean to say that there
118 is no oxidization in the mine; there is a great deal in places. you find the red iron stain stuff, but I do not notice that there is any connection between them.

Q. That terminates between that and the west——

A. It terminates against the Brougher capping, which has the same effect as the andesite cap beneath.

Q. That was at one time also eroded surface?

A. I should judge it was.

Q. Have you examined the termination of that vein up against the Brougher mountain dacite in the west country to determine whether there is any evidence of that vein having once been oxidized and once been the surface?

A. I have; I find a similar condition at the head of the vein; there is a place where you can find oxidization and of course the cap rock which has been termed the Brougher mountain dacite is a much more recent eruptive than the cap rock which is termed the andesite and lies over the eastern portion of the mine, so that the conditions under the andesite cap and the conditions under the Brougher dacite cap may be different.

Q. That is may have been different?

A. Yes.

Q. So that the oxidization which may have been found in a pronounced degree along towards the west, is a larger degree of oxidization than occurs where you have indicated the upraise?

A. If there is any difference I would naturally expect to find it there, because the eruption came at a later time and a longer period to oxidize.

Q. When we speak of geological time we do not think in terms of days or months or years?

A. No as the geologist says a million years is but a moment, so that is too long for me; but you may be misconstruing my ideas; I do not suppose for one moment that this edge against the Brougher Mountain dacite stuck out into the ground there; I presume
119 that this vein along this edge extended much further to the west, it certainly is an absolute impossibility that this enormous volcanic eruption, where there is not only manifested a vast upwelling, but a vast upwelling as shown by the brecciated material, and immense blocks of rocks are included in this Brougher, that it is an absolute impossibility that it gently shoved up and did

not affect the oxidized surface of the vein. It must have broken off immense portions of the vein; but this is pure theory on my part, I do not know the facts. It seems to me inconceivable that it came up and did not disturb the outcropping edge of that vein; so the oxidization that is along that vein I would say is all subsequent to the erosion and due to the surface waters which have percolated down, and assisted the oxidization which was there before the volcanic eruption of Mount Brougher.

Q. Isn't it a fact that in many portions of this mine, other than up at this critical point of it, that you find these rolling shaped ore bodies that form anticlinals in a smaller degree and that the miner has mined them in that shape and that the stopes show them to be in that shape?

A. No.

Q. That is true, is it?

A. That is not common.

Q. Does it occur?

A. It does occur in more than one place.

Q. Let us point out all the places where it occurs?

A. First in the connection between the McNamara stope, at the foot of raise A.

Q. I am speaking of the mine?

A. There is no rolling connection as termed, but there is a case where stopes have come up, if you use the term roll to the stopes themselves, it is proper; There is another marked case in a small space lying under the fraction vein in the Jim Butler mine and shown upon this model where the red——

120 Q. 728?

A. At raise 728. There is an ore body which lies neither in the main vein nor in the fraction vein, but on a small branch of that vein, there is a c-se where there has been,—there is a stope which goes up similar to the stope of the McNamara. There is one other place where there is a little roll in the vein, if you wish to use it that way, two fractures have created that appearance, and that is in the Jim Butler workings from cross-cut 712. It is very small and minor and is correctly shown by the stope running out from this 712; it is compared with the entire vein almost unnoticeable, but it is a portion of the West end vein, where there is in the end a slight dip to the north of a portion. Those are the only places that I recall in all of the mine.

Q. What is there to indicate in this section of the country underlying raise A, where the stopes go up from the West End workings, pass over, downward, *is* it does pass, on the north dipping vein to indicate separate and distinct veins? I am confining you now to the indications in the wall as they remain there regardless of what is shown in raise A?

A. In the stope itself before this work recent work was done there was very little indication; as I stated in the first place I do not believe I would have been a keen observer to have originally noticed anything, although there is today in the wall of that stope an appreciable displacement,—a displacement of about ten inches in hang-

ing wall side; about ten inches between the south dipping vein and the north dipping vein; it is however apparently trivial, but I cannot say if it is, it would have been sufficient without any knowledge whatever to have given me the idea that there were two veins.

Q. Well, is it not a fact Mr. Wiley, that the controlling
121 factor of this determination of your-, that there are two veins, is the change in the dip?

A. It — one of the factors; it is by no means the determining factor.

Q. I didn't ask you that.

A. It is the factor which would primarily lead me to suppose they were different, because it is a very unusual condition. The same vein dipping as these do. Not that it is unusual for a vein to change its dip; it is common, but the controlling factor which leads me to the conviction that these are two separate and distinct veins is the factor which, Judge Lindley, you have asked me to dismiss from my mind and which I cannot.

Q. Well let us stop and investigate the conditions there in that upraise? What is the structural difference between the north dipping vein and the south dipping vein?

A. The veins are similar in filling. You cannot tell by the quartz which vein it came from.

Q. What is the difference in the vein which is shown in the north dipping and the south dipping vein, and that vein shown in the upraise?

A. The veins are similar in appearance except that there is not payable ore, although there is some ore of value in the vein.

Q. How is it structurally compared with the north dipping vein?

A. It lies conformably in dip with the north vein, as the upward continuation of that vein,—in my opinion.

Q. Is the formation, the vein material, shown in that stope, the same identically the same as that shown in the north dipping vein?

A. It is the same.

Q. It is the same?

A. I do not wish to say the same identically, because I could not say that, of the same vein at ten foot intervals, it is the same
122 throughout but there are often variations in short distances in the filling of any vein, so that the words 'identical' is too conforming.

Q. You do not like to answer that question categorically?

A. I like to say that it is quite similar both as to quartz——

Q. Can you tell the vein filling and vein matter, taking the cross section between the south and north dipping vein, take the material and distinguish it if you saw a cross section of the vein?

A. If I saw a cross section of the vein? If I saw the quartz whether it be a chunk or a wagon-load, out of raise—A, and a chunk or a wagonload out of the north dipping vein, I could not tell the difference except as you might select ore from one or the other, and in raise A we do not have payable ore.

Q. Well, quartz is quartz, isn't it?

A. Broadly speaking it is, yes, a definition.

Q. But a vein is very frequently made up of other things than quartz?

A. Very often.

Q. Now I am asking you to take this vein as a whole, not by a piece of quartz, and compare a cross section of that vein with the south dipping vein. I am speaking now of what a miner might term vein matter as well as the included quartz, and compare what is shown in that upraise, either the south dipping vein or the north dipping vein, as you please.

A. As I said before it is similar filling; it is not ore, and you can get ore from many portions of either of the other veins.

Q. Does it contain anything not found in the other veins?

A. I have not observed anything distinctly.

Q. Well, have you observed anything which would lead you to believe that there is a difference?

A. Not any more different than you will find in the same
123 vein in different places, close to each other.

Q. Roughly or minutely rather, if you please, describe the contents of this vein as it occurs in the upraise. I am referring to the upraise marked —A in the neighborhood of 152. Describe the contents of that fissure. That is a fissure I believe, is it?

A. There is a fissure extending up that raise.

Q. What is the width of the vein in the fissure?

A. I do not know the entire width of the vein as disclosed. The width of the working is four to five feet.

Q. Four to five feet?

A. Goes up on a slope of around thirty degrees, about the same as the stopes below, for a height of around fifty or fifty-three feet, if I remember; something like that. It follows a streak of quartz at the place two or three feet and enters narrower*m* considerably narrower; but as I stated that vein is often wider than that, but I do not know that it is disclosed in this raise.

Q. What is there in the vein besides the quartz?

A. Country rock, in that section a trachyte and that is immediately beneath the cap? Within a very few feet.

Q. Does it contain any round pebbles or anything of that kind?

A. I think that you will doubtless find some round pebbles, the same as there is in most veins. I don't recall any distinctly but I would naturally expect to find some there.

Q. In stoping that ore, evidently, the miner has evidently not paid any attention to the vein shown in that upraise?

A. No, the quartz in that upraise is not pay ore.

Q. To what extent has that vein at that point an upward extention?

A. Probably to about only the extent of raise—A, fifty feet or so, because the cap lies immediately above and is developed in raise 152 within ten or fifteen feet of the head of this raise.

124 Q. That must have been pretty close to the original surface before the later flow?

A. Yes, sir.

Q. Was the original, wasn't it, in your judgment?

A. It was the surface at one time.

Q. Any evidence of oxidization in the upper part of that vein?

A. Nothing striking.

Q. Was any gouge or selvage or slickened side to indicate a movement?

A. I noticed no special slicken sides, but it is not as striking there as in portions to the east.

Q. Now are you familiar with the section of the mine disclosed in the cross-cut, what we call the 712 Butler cross cut?

A. The 712 Butler cross cut is shown on the model on the seven hundred level of the Butler extending where I now hold my pointer. I have been through there, yes sir.

Q. You recall the conditions shown in the 7-A raise?

A. I do.

Q. Do you find any conditions shown in 712 Butler Cross cut similar to the conditions shown in the 7-A raise?

A. Well, that is rather hard,—I find the quartz in the cross cut in places where it intersects the vein, and some quartz in the trachyte between, and I find some in 7-A; I find trachyte in each case.

Mr. Lindley: Will you please read the question?

(Question read.)

Q. Can you answer that yes or no?

A. Yes, in the way that I have mentioned.

Q. That cross cut cuts quite a number of stringers.

A. Yes, it does; most all quartz which is impregnated out of the trachyte.

Q. How about,—state the conditions shown in what would be a cross section, if you can, in the Jim Butler raise- 595, 571, 571 and 573; our raises 571 and 573.

A. I do not know which they are. Will you please show me.

Q. Yes. We have not got our numbers on here. They are very near your cross section?

A. They are not Jim Butler raises.

Q. West End, I mean. I beg your pardon. I should have said West End. I want to call your attention—bearing in mind the conditions that you say exist at the West End of that roll where if it had not been for the putting up of that raise, you might have been led to the belief that it was all one vein that changed at depth; I want to ask you if you have really in mind the conditions as shown in the raises 571, 572 and there is another raise on the four hundred,—494; that is the raise I have reference to. Well, let us confine ourselves,—I will get that straightened out in a minute,—to the raises 571 and 573; first I understand that raise 571 is in close proximity to your cross section; what is the number of that cross section?

A. A and B.

Q. Well, now we go a little further to the west and take the up raise- 571 and 573. I wish you would describe to the court just exactly what is exhibited in those upraises, as showing the change in the width of the vein, if there is anything, or showing the exact re-

lationship in which these two veins exist in that section of the mine?

A. You have asked me to just exactly and precisely describe it,—I would prefer to refer to my notes.

Q. You have a right unless you say — cannot do it without your notes?

A. I can in a general way.

Q. So long as we get the results in such a way that I can understand your statement? You understand what I desire to
126 have explained?

A. Where you have emphasized the word "minutely" and therefore I would prefer to use my notes.

Q. Well, proceed, we are not going to quarrel over a little matter like that.

A. I have a little sketch here in my notes.

Q. Well I would like to see the cross section when you get through with it.

(Cross section handed to Mr. Lindley.)

I assume Mr. Wiley that these were made underground, made on the spot, or at least computed after a reasonable inspection.

A. These were as a matter of fact sketched underground, that is all of the marking*ing* indicating the veins or geology, or anything of that sort; they were accurate cross sections made before going underground from the survey, and then the observed facts put on.

Q. Give us the three raises there?

A. 569, which is the most easterly of the raises come- up from the fault upon the south dipping vein.

Mr. Dickinson: Mr. Lindley, I would suggest that it might be well for the witness as this is a sketch not yet in evidence, in describing it, to have it where the court can see, in order for him to know what it is.

Mr. Lindley: If counsel wishes the witness to put it in I have no objection.

Mr. Dickson: Just as you please.

Mr. Lindley: Well, I do not care, Judge Dickson, just whatever way that you want to do it. I want to get at the general deduction here.

Mr. Dickson: Well, you wish the court to understand it.

Mr. Lindley: Well I could not understand it unless I saw
127 the sketch. Proceed any way you please gentlemen. It is up to you.

The Witness: Shall I show this to the court?

Mr. Lindley: If you wish.

The Witness: The picture always to me is plainer than a description.

Mr. Lindley: Well, identify those as soon as they have been,——

The Witness: The first sketch is marked "R-69."

Mr. Lindley: Mark it "Wiley—5" and the*m* number them along, as they come.

(Sketches marked for identification.)

A. The sketch marked "Wiley—5" is a cross section of raise 569, in its upward part, and it also shows the raise 488, which is on that same immediate cross section, extending above this, as well as the workings upon the north vein, lying immediately to the north; the red color is meant to represent the south dipping vein; the stopes upon this vein come up to the place marked "stope" at 68-feet, dips 30 degrees, that indicating the dip of the south vein at that point; the raise goes up,—the structure of the south dipping vein, the dip of it indicated the mark 49 degrees, at a point a short distance above this, marked "ore" there is a clear cut cross dipping direction marked 48 degrees and dipping directly across; that is a point which I have called the top or highest point up on the south dipping vein.

Mr. Lindley:

Q. Can I ask you with reference to the nature of that, if it — just a slip or is it a fault?

A. It is a cross fracture, not I would say a distinct fault, although there has been some little fracturing along there, indicating possibly slight movement.

Q. Does it fault towards the vein?

128 A. The extent of the fault if it faults the vein, I do not know. It does fault the vein in the sense that it interrupts *the* its continuity upward.

Q. Now, just one moment please.

A. I mean by that that if there is a fault I do not know just how much faulting there has been.

Q. I would like to get your understanding as to what your fault is. What is a fault?

A. A fault, as it is commonly used, is a cross fracture running,—not necessarily a cross fracture, it may be coincident with the plane of the vein in direction, and usually it is more or less at variance in direction. It may interrupt the continuity to a slight extent or to the extent of hundreds or thousands of feet; I have heard of faults being of a mile displacement, and on the other hand it may not be much at all.

Q. However it indicates a movement?

A. But the movement may be from an infinitesimally small movement, to an enormous distance.

Q. A sheet of paper might be placed in the section and destroy the continuity. Would you call that a fault?

A. There might be the plane of fracture of the fault represented simply by a sheet of paper, and it might in that sense be a fault, and yet not have faulted this particular thing; not have thrown it or displaced it.

Q. At this particular point where we are discussing the vein are the walls displaced?

A. I do not know, I simply know that I am going upward at 49 degrees to the south, and I meet a cross dip of 48 degrees to the north.

Q. But that vein continues on in the same plane. And that course on its upward extention?

129 A. By no means. A vein continues on in an entirely different plane.

Q. There is has the same upward direction?

A. Both go upward but entirely in a different direction.

Q. Well, as I understand your illustration, might not you have got your intersection of that so-called cross plane before it commences to turn to the south and the north so that there is still an upward segment which you say destroys the continuity,—but nevertheless it continues upward in the same plane some distance.

130 A. The working continues up a short distance but the vein does not.

Q. Has not the vein been in the working?

A. The vein is in the working, the south dipping vein is in this raise 569 to the point where the dip of the structure and the dip of the vein is entirely different. Above that a working goes in the north dipping vein rather poor for a while, and a good deal of trachyte country in there until you reach the foot of 488, which has been driven upward back above the top of the south dipping vein for a considerable distance. The scale of these sketches is 1 inch equals twenty feet. May I mark that? It is not on.

Q. Certainly.

A. So that the squares on this, the large squares represent 20 feet, and the small squares each two feet.

Q. Well, have you finished with that sketch, Mr. Wiley?

A. I think the sketch itself shows, except, I think I should, in fairness, Judge, explain that under this point there is a working which has very much more the appearance of a roll of the vein, or bending than the 569 itself, and I have put that upon this section.

Q. That is shown on the model here, is it not?

A. It is shown on the model. And there you can follow from raise 569 to working——

Q. It is on here. I am pointing now to what is marked here 569.

A. You are pointing to the same raise as I have indicated upon this cross section. You are following quartz there right around on a gentle slope, come around level for a ways in quartz,

131 a little trachyte where these dots are marked. I think I should explain that I did not carry many colored pencils underground, and my conventional sign for trachyte is a series of dots. But you go in quartz, very large, good body of quartz all the way from this south dipping vein, follow around to a north dipping vein, you have not left the vein all the way. But you go from the south dipping to the north dipping vein, and you have no interruption other than this cross break between the quartz of one and the quartz of the other, and you have similar quartz.

Q. Now, with reference to this quartz break, so called faulting which you named as the terminal edge. You claim that is the terminal edge of the south dipping vein?

A. I don't know just what the terminal edge, I suppose the upper portion of the vein would be the terminal edge.

Q. Well, what is a terminal edge? What do you mean by a terminal edge? We will see that our definitions may agree.

A. I presume that as applied to a vein would be the portion, assuming that this is the hanging wall where I now hold my pointer, that is the highest point on this cross section and the terminal edge would be the line following through this plane of section in an easterly and westerly direction.

Q. Well, do you claim that that is the apex of the vein at that point?

A. Well, I am not giving a legal definition of a vein. I can give you a miner's conception of what an apex is.

Q. Well, you fixed an apex for the defendant in this case.

132 A. I can give you——

Q. And I want to get your idea of what an apex is to see if it follows the idea of a terminal edge.

A. I frankly confess, Judge Lindley, that my conception of an apex is taken largely from a work which has helped me very much, "Lindley on Mines."

Q. I knew I would get it before I got through with the case. Never tried a case in my life that I did not get it. The great trouble is that you people pick out such things and suit yourselves, and you do not always pick out things that suit me.

A. Well, it must suit you because you have very clearly stated it, that the apex of the vein is the surface, and I fully believe that is right. It is not the terminal edge. It is the surface. The top of the vein at the surface is the apex, in my opinion.

Q. It may be blind, may it not, and not reach the surface?

A. Then it is that portion nearest the surface; the part nearest the surface.

Q. Well, doesn't that involve the element of terminal edge?

A. The terminal edge would be one boundary of that surface.

Q. Then, it is an essential definition of an apex that it is the highest point nearest to the surface, reached from a descending point to an ascending point on the dip of a vein? And the terminal edge is where the vein ceases?

A. On its upward course.

Q. On its upward course. Is that correct?

133 A. A point on the terminal edge could be so represented.

Q. It would be represented in cross sections as a point, something more than a point, it is a surface?

A. I think it is.

Q. A terminal surface?

A. Yes.

Q. That is beyond which the vein has no further extension upward?

A. Correct.

Q. That is correct. Then, we agree, and "Lindley on Mines" is vindicated this time. Now, taking that definition of what constitutes an apex, is it your opinion that the termination of that vein against that slip there comes within your idea as to what an apex is?

A. In this particular section, yes.

Q. Is there anything that continues beyond?

A. There is nothing. I have no knowledge of anything in this particular section.

Q. In this particular section?

A. Yes.

Q. Well, you have a knowledge in some other section where that thing don't happen?

A. I have, other sections close to this where it is not cut off in the same way.

Q. Then, you m-ke that an apex on account of this slip?

A. In this case it is the upward portion of the vein.

Q. And the vein has no further upward continuation beyond that slip?

A. It has not.

Q. Has it any continuation in any other direction?

134 A. It has continuation downward and to the east and to the west.

Q. But not——

A. Not upward.

Q. Has it a different dip? Does it continue on in an opposite dip? Does the ore continue on in an opposite dip?

A. There is ore in the north vein continuing on in a directly opposite dip, both downward and upward.

Q. And the only thing that segregates the two is this slip?

A. The only separation is this in this immediate working in this slip.

Q. Are there not through this mine an infinite number of just such slips where there is evidence of faulting and displacement of the vein?

A. There are a great many slips in different directions.

Q. Does that constitute separate veins whenever those things occur?

A. No.

Q. There are a number of very marked displacements, are there not, caused by faulting?

A. There are.

Q. One of them shows on your cross sections here?

A. There are several shown.

Q. Take for instance what you have illustrated here as the Fraction vein; we have got a fault there.

A. We have.

Q. Does that destroy the identify of that vein?

A. It does not, if the two sections are portions of the same vein.

135 Q. A portion of the same vein. Well, you have no such condition as that shown upon your exhibit "Wiley No. 5," have you?

A. No.

Q. Now, you may proceed with your next section.

A. The next section marked "Wiley 6," is a similar cross section of raise 571. There we have the same or similar conditions, the stope upon the south dipping vein. We have a similar cross fracture

in this raise, and we have a similar working which has been made over on the north vein. In this particular workings, while I consider the portion immediately above is a part of the north dipping vein, I have not colored it and I have marked, a little quartz, trachyte. It is essentially a trachyte in the vein. There is one point where I have marked a red streak above that which has a nearly vertical depth, dipping slightly towards the south, which is probably a portion of the south vein. I have marked it red. Across the top of this, I have drawn a distinct blue mark, which is the hanging wall of the south dipping vein and contains some clay. There is one unusual condition in this cross section, which is shown in cross cut 430; there is a two foot streak of quartz, south dipping above there. That is the only place in the mine where I have noticed that south dipping quartz above the north dipping. You asked me a while ago about that and I said I did not observe any upward extension; there is the only place where there is such extension.

Mr. Dickson:

(Q.) This is on Wiley 6 now you are referring to?
A. Wiley 6.

Mr. Lindley:

(Q.) Well, you have not indicated that slip; is that a
136 clean parting between the red and the yellow, that slip?

A. That is a very clean parting, at the top of the red for a distance. At the extreme bottom it is not. I have not drawn that slip clear through for that reason, that at the immediate floor there is not.

Q. An unbroken footwall there, is there not?

A. No, I don't think it is the footwall. I think you could sink down a winze here in quartz for a considerable distance. This is an instance here of what I endeavored in my direct to call attention to, of the mineralization under these two veins. Extends in some instances as much as a hundred feet away.

137 Q. As a matter of fact, a miner in stopeing that would stope that all as one vein, wouldn't he?

A. No, he hasn't stoped it as one vein, so I don't suppose he would.

Q. He has not?

A. They have stoped there and they have all been in the South dipping vein; no stope in the North dipping vein at all.

Q. I am speaking now of the occurrence not in that particular stope, but the occurrence when he meets it anywhere in the mine?

A. If that was all paying ore, why he would have stoped it all in one mass, regardless of its dip; that is true.

Q. But the ore is there, and it has not been stoped?

A. I have got a place marked here, but that is on the North dipping vein. That does not necessarily mean that there is a body of stopeable ore, but there is some little good ore.

Q. Miners do not usually pay much attention to slips of that kind?

A. He is after his ore and follows that wherever it goes.

Q. Unless it faults his vein and he has to find the faulted segment he does not pay attention to those slips?

A. If his vein is distinctly cut off by a fault, he naturally endeavors to find the faulted segment, yes.

Q. So long as the ore continues, he continues at his work? That is a fact, isn't it?

A. The ore is the primary thing, certainly.

Q. Well, now, there is another section you have there, Mr. Wiley. Have you marked this?

Mr. Dickson: That is marked "Wiley 6."

A. The next section is a section of raise 573, and shows a different——

138 Mr. Dickson:

(Q.) That is marked "Wiley 7"?

A. This is "Wiley 7." It shows a different condition in that the cross slip there is not so prominent. It is marked and I have got the word "Fault" marked, some little faulting. And the red in that case extends above that for a considerable distance. That is essentially the same, there is a body of trachyte there in between. I have marked it trachyte—"Tr."

Q. Where do you say is the terminal edge of that red vein?

A. It would be the highest point, which would be beneath the raise 461, which extends back beneath the footwall side of that raise. Extends in the North vein.

Q. Then you ignore the slip as constituting the terminal edge in this cross section?

A. In this cross section; further to the west the quartz of the south dipping vein itself extends up above this particular slip which is shown there.

Q. Then that particular slip there hasn't anything to do with the termintation of the vein in its upward course?

A. It hasn't in this section, nor has it on some other sections further to the west.

Q. With reference to the condition west of that upraise, that is, west of this series of raises, 2 A, 4 A, 5 A, 6 A, 7 A, what is the distance, measured in the plane of the vein westerly before the contact upon the two veins is disclosed in the workings? There is an intervening space between your 7A on the model and the area covered—between that point, and generally speaking 302 E; what is the distance of unexplored area there?

A. The distance between 7A a-d 302 is about 350 feet.

139 In that section there are no workings which disclose both of the veins. In fact, there are no workings which disclose any of the veins near their top.

Q. Well, that is undeveloped?

A. That is undeveloped and very much *much* distrubed by the cross Edwards fault, and also by the descending cap rock.

Q. Well, you do not doubt but what the veins exist in that section, do you?

A. They exist deeper down, that we know.

Q. Well, have you lost your apex during that 300 and some odd feet?

A. No.

Q. Where is it?

A. There must be a—the highest point to which the vein goes. The highest point developed upon the vein in that section is shown by the raise above the 400 foot level. They have not reached the absolute apex through that section, so that must be at a somewhat higher elevation.

Q. I am speaking now of the lines of contact between the two?

A. The north dipping vein is undeveloped and unknown for a section through that area, due to faulting. And its apex is doubtless much lower down on account of the rapidly descending cap. In other words, there is unquestionably, in my opinion, through this section an area where it would be an impossibility to bring the top of the two together because it does not exist.

In other words, each of the veins, the south dipping and the north dipping, for a considerable section will have apices
140 which are some distance apart. Even if originally the two met, if it were an arch, it would be the bottom of the arch, and if coming at angles it would be the apex, that has been entirely scored away and buried beneath the cap, so that for a distance there they must have separate and independent tops.

Q. Well, that implies a considerable force and a considerable grinding and moving to eliminate all that section of country, does it not?

A. No; to my mind it indicates nothing of the sort, necessarily, although there has been through this area the Edwards fault, and that has had its effect upon the dislocation. But to my mind, the main factor is the cap; that the cap is much lower down in this area than it is further to the west, and therefore the original surface, the eroded surface was lower down, and the erosion, even assuming that these veins originally did meet—and I don't know that they ever did—but if they did meet originally, they were eroded away so that they had entirely separate outcropping tops to the surface of the ground before this andesite cap came on.

Q. Wherever you find the yellow and red veins in conjunction in the west section, now, proceeding towards the westerly section of the ground from 300 to 3B, I assume that the first point going to the west from raise 7A where the two veins are shown in the model to be in the contact is in the raise 302——

Mr. Dickson: Will you excuse me? I want to get the question.

Mr. Lindley:

(Q.) 302, is that the correct raise?

141 A. Yes.

Q. Now, the first point going west from 7 A, as I understand it, what is the condition there where those two things are in contact?

A. We have a similar condition. We have a raise, 302, going up from drift 302 E on a vein which dips about 28 degrees to the south, a large body of ore. We follow up that raise and we meet a vein having an opposite dip.

Q. At that point what is there to indicate a difference between the two veins?

A. The difference in structure. There is a small fault shown in blue across the red at that point. But the dip of the vein for a distance above that is still to the south, and at the head of that we meet a raisr dipping in an opposite direction shown by the yellow coloring, and this is upon the north vein—a portion of the north vein.

Q. There is no faulting of either vein at that point in the sense that it indicates a movement, or that the parts are dislocated?

A. There is only the faulting shown by this blue streak, and there is a very considerable movement or indications of faulting along the hanging wall of the north vein itself. There is a blue mark on this raise also lower down which is not colored for this section here, because it — entirely inac-essible and it is caved through that section and I have never seen it. But lower down in that raise I know there is a fault of considerable magnitude. There has been extensive faulting, doubtless faulting greater than usual through that section.

Q. Well, the section between 7A and the raise you just
142 now spoke of is practically undeveloped?

A. It is undeveloped above the top of the workings shown.

Q. Above the top of the workings shown. And whatever you have to say in regard to that is conjecture or probability?

A. It is based upon the development as shown.

Q. It is what we call projection, mental projection?

A. No, it is a great deal more than mental projection, because we have the physical fact of the vein deeper down in the raise,—extending above.

Q. I am speaking about that area that has not been developed so far. That necessarily must be projection?

A. That is projection based upon the facts observed.

Q. Undoubtedly; no question about that. Because if we had had no basic facts, there would be no projection. Can you give me the dimensions of that slip? I am back to raise 302 now. Describe that slip. Is it in gouge? Is it a parting? Is it a distinct cleavage between the walls?

A. It is a distinct cleavage across the vein.

Q. Well, how thick is it?

A. The rock is broken for a considerable distance, but the particular, the most noticeable cleavage or line of dark material there is comparatively within two or three inches.

Q. Is it that thick?

A. Yes.

Q. Two or three inches. Is it a gouge?

A. Two observers can differ as to the width. A fault often has clay which may be quite thin, from the thickness of a piece of paper up to any thickness. And extending back of that would be
143 the material more or less broken. One man might limit his width to the exact dark clay, and another man might take in the zone of brecciation extending back from this slip. But there is a very distinct slip there a few inches in width; broken material extending back for some distance further.

Q. The walls of the vein faulted——

A. The walls of the vein——

Q. I mean in juxtaposition do they not continue along precisely in the same plane above that slip, in the same direction that they continue below?

A. The quartz does.

Q. Well, the quartz is vein, isn't it?

A. It is, usually.

Q. Consequently, you say that that slip there terminates the South dipping vein and makes an apex?

A. No, not in that raise, and I haven't so represented it.

144 Q. Well, the walls of the veins faulted; I mean in juxtaposition. Do they not continue along precisely in the same direction as they continue below it?

A. The quartz does, yes.

Q. Well, the quartz is the vein?

A. It is.

Q. Consequently, you say that slip there terminates the south dipping vein and makes an apex?

A. No, not in that raise, and I have not so testified.

Q. Not in that raise. What effect has that slip had on the continuity of the vein?

A. It has none.

Q. What is the difference between that slip and the slip that has occurred in the east end of the mine?

A. Nothing whatever.

Q. Why?

A. In this particular working the quartz of the south dipping vein continue- up to the same dip it has below, whereas in 569, it——

Q. It turns over?

A. It has; it does not turn over but it meets quartz having an entirely different direction, extending downwoard and beneath the stope extending downward and upward.

Q. In one instance the slip makes two veins and in the other it does not?

A. No, that is not true at all.

Q. Why isn't it? It is the change in the direction of the dip?

A. It is the change in the direction of the dip, a marked change to the continuity in both directions of one vein, and a seces-
145 sion in the upper direction of the other.

Q. Now, have you any more upraises out to the west here that are similar to your upraise down at the east end?

A. There I have a——

Q. I have reference to 2A, 4A, 5, 6A and 7A and others than upraise A which you have testified to before?

A. No, none similar; we have several upraises in that section but they are not what you would say are similar. They have followed the north dipping vein upward.

Q. Above the south dipping vein?

A. They do not.

Q. They do not go out above the south dipping vein?

A. Many of the raises, but they do not follow the north dipping vein.

Q. In many points to the west of raise 7 A in that upper working where you follow the north dipping vein above what we call the junction of the two veins, with the exception of raise A?

A. There are not, except that we have a portion of the north dipping vein shown in the raise extending above drift 202. The cap through this section is shown by the green color as coming down and cutting off the upper portion of the vein. The upper portion of raise 366 plainly follows, and inasmuch as it is cut off by a capping I presume that is the cap of that vein, so perhaps I should refer to that as an exception to the general statement that there are no raises.

Q. What is the condition observable where these two veins are in contact at any point in the workings beyond the raise you have just testified to as 302 A? I want to get at the structural
146 conditions wherever those two veins are in contact to the west, taking up every place where they are in contact and I want you to describe to the Court what the situation is.

A. The raises which extend above are all shown upon this model. The next raise to the eastward of this is raise 364, which extends up upon the north vein, but the upper portion of that is not colored because the air is so bad that an acetylene lamp will not burn and I have not been able to tell what is up there.

Q. When was that raise put up there?

A. I do not know.

Q. Is it an old mine working or a litigation upraise?

A. I think it is an old mine working.

Q. Proceed.

Q. The next raise is the raise extending above this 203 and connecting downward with the yellow raise extending to the MacNamara stope; this raise is up to the cap as shown by the green color and the ground beneath the yellow is only a portion of the north dipping vein because beneath that we have the violet trachyte and then again the yellow, or the main portion of the north dipping vein; in that drift, 203, on the 200 level we have the south dipping vein not only in the drift, but further to the west by the stope. Then there are a series of raises extending above this drift, one marked 203, which extends up upon the main south dipping vein and is cut off by a faulting, so that the top of that raise is entirely in trachyte and is so colored. The cap must be very close as shown by the adjacent raises, but it has not been reached in the working so that there

147 *there* is a strong likelihood that raise 203 is really up to the apex of the south dipping vein, but, not having the cap I would not absolutely be certain that is the highest point of the vein; I believe it is. Going further to the east——

Q. One moment. There is a drift below that where you have a line of demarkation between the red and yellow, a drift or cross cut?

A. Yes.

Q. Now you have a line marked red on that drift, a coloring red, adjoining a yellow coloring.

A. I have.

Q. What is the reason for not marking that all red?

A. The western portion of this vein is upon the south dipping vein. It is actually connected by a short little raise from the vein above; the quartz has the distinct south dip; the southern end of this working has a northerly dip and is in the northerly—the quartz in between is similar; there is no reason absolutely for drawing that distinction at that particular spot, just the same as there is no reason for drawing the exact spot in some of the cross cuts underlying the vein further to the east. That is the direction. We have, first, a vein plainly dipping to the south; at the other end of this cross cut we have a vein clearly dipping to the north; in between we have a stope where the quartz structure is vertical; instead of dipping east and west, it runs north and south, and it is another of those

148 cases to which I alluded or endeavored to make in my direct. Where this north and south break between the points has been silicified, filled with quartz, but you can pass from one to the other in quartz and you go up on one dip and you pass through a vertical dip and a strike at right angles to the strike of the vein, due to the structure across the vein, and you go down then upon the other dip. This is not in any sense a bending from one to the other but it is passing in quartz from one to the other; the structure of the intervening quartz, agreeing neither with one vein or the other.

Q. Now have you any other further connections those so-called two veins? You will permit me to disagree with you about these being two veins, but I am simply following you to get the situation; beyond the point that you just testified to where you stated there is no real reason for the demarcation between the red and yellow going to the west, the next occurrence where the veins are together and where you have the red and yellow marked as in the neighborhood and vicinity of your raise A—are there any other intermediate connections between those two points where the two veins are shown in contact?

A. No; we have the main vein shown in contact.

Q. I am speaking of the red and yellow.

A. No there is not any.

Q. You have examined this ground where we claim it to be a roll?

A. I have.

Q. And ordinarily as you started out to state early in the day, anybody might be mistaken and think that it was a roll in the same vein?

Mr. Dickson: He said that he might be mistaken.

A. I said that if there had been no development in the entire mine, and these new raises had not been made, I probably
149 would not have been observing enough to see this slight indication in the dip, but I would have said you could follow from one side to the other in the same vein.

Q. Well, of course, if you could be mistaken about that with your judgment and experience, a miner might be mistaken?

A. That is all, unless they had this opening.

Q. Well, that is all you have?

A. Well,——

Q. Well, so this is a litigation raise?

A. I know that has been made.

Q. And a miner never discovered that particular vein, or had any particular thing to do with this vein?

A. The miner followed his ore and the ore in this case, did not extend beyond the bend, where these two veins came into juxtaposition.

Q. In other words I presume no criticism could be made as to this winze that was run up by the engineers?

A. It was run up to determine whether the north vein did extend beyond the other, and the explanation that that might be the cause doubtless started from the absolute proving of the fact that it did extend further to the east.

Q. That is proved according to your ideas?

A. Yes, sir.

Q. Have you reached the domain in your career where you can say that anything is positively proven?

A. It is proved to my mind that is what I always mean.

Q. Now I show you a couple of pictures here Mr. Wiley, and I ask to have them identified as "Wiley's Cross 1" and "Wiley Cross 2." I show them to counsel before I offer them in evidence. They are underground pictures illustrating these rolls.

150 Mr. Dickson: Taken by whom?

Mr. Lindley: Taken by Mr. Bradshaw. Simply going to show them to Mr. Wiley in connection with his testimony simply by way of illustration.

Mr. Dickson: Very well, I understand.

Mr. Lindley: Now I will show you a photograph marked "Wiley X3," and ask if you want me to tell you where it was taken and I will tell you in advance; perhaps you may identify it without my telling you.

A. I would suppose from the timbers more than anything else that was a representation of the Jim Butler stope in the Jim Butler workings.

Q. At the seven hundred?

A. Yes, sir.

Q. You guessed right. It shows the roll as you have described it in your testimony?

A. It does.

Q. That is a fair, correct representation of it?

A. Yes, there is a roll, I would probably call it that too. It has the appearance of a roll.

Q. Well, that is what you would call it if you run across it in the dark?

A. In the dark yes, but when I had some light on the subject I would not.

Q. Well, its physical characteristics are not shown by your light are they?

A. Yes, sir.

Q. Your vision was changed?

A. Very much, and the photographic illustration,—I would like in justice to myself to qualify my original term of the roll by the fact, by the explanation, why we plainly follow up and come over; maybe it is a roll,—it is a bend a slight roll; still the fissure as indicated in the upper left-hand side of the photograph, and another fissure which does not show, which would be on the right side,
151 apparentiy do extend up, and also, especially in the drift below where you could trace another view showing the extension of the drift, in these walls apparently beyond. In other words instead of bending they, to my mind seem to cross and make an "X" and so you may have here instead of a roll merely a meeting of the veins. This fissure on the other side may extend beyond as you have simply developed the lower portion of the X or the lower portion of the inverted Y, but in any event you have very nicely illustrated the appearance of the roll.

Q. Well, it took me a long while to get around to it Mr. Wiley. Well, now I will show you another picture here and perhaps you can identify this? Complement the photographer by identifying it immediately; it is taken by the same man?

A. Yes, I can complement the photographer on the first but on the second, this is very much out of focus as regards the major portion of it, and I must confess I am unable to identify that position in this short time.

Q. I can tell you where it is taken. I asked who the most competent photographer was in town and was told that the gentlemen who took these pictures was. Well, I will tell you where this was taken; this is taken at the bottom of your A-raise, they put their camera at the bottom of the A-raise of the McNamara stope, pointing north 45 degrees.

Mr. Dickson: Can you explain to the witness in what direction the camera was pointed?

Mr. Lindley: At the raise.

The Witness: This does not do justice to the stope, there is a better looking appearance of a raise there than this picture shows.

Q. That was due to the infirmity of the photographer?

A. Or the limitations of the excavation.

Q. That is a fair illustration of it?

87

152 A. I don't doubt but it was a picture taken there.

Q. It is the best we could get at under the circumstances, we may do better on a second trial. I want to make the witness's testimony clear of what he want- us to think his views are and I am quite content. It is now twelve o'clock.

The Court: I would like to ask one question. I understood him to say that one of his cross veins of quartz, contained quartz differing from the veins themselves. Is that correct?

A. Different, not in the nature of the quartz, but in the direction; it stands vertical and the fracture in it ran north and south.

(At this time a recess was declared until two o'clock P. M. December 9th, 1914.)

153 Afternoon Session.

WEDNESDAY, December 9th, 1914—2 o'clock p. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Cross-examination of WALTER H. WILEY, resumed.

Mr. Lindley:

(Q.) Mr. Wiley, for the purpose of clarifying the situation up a little in my mind, I wish you would kindly take this string and indicate what you consider to be the line of contact between the north dipping vein and the south dipping vein, so that we can discuss certain matters that are to be considered in connection with one of your horizontal maps. I want to illustrate the condition on the 400 level, as shown on your plan map with reference to the position of the veins at their—what we call the crest or the axis of the anticline, what you call the intersection of two veins on their upper courses. I understand that that section on which you are tying that string now, if you are going up to the yellow and red in the Tonopah Mining Company's ground, that that is a disturbed section. For the purposes of illustration, kindly take it from within the West End ground. This will simply illustrate the question——

Mr. Dickson: That was what I was suggesting to him.

Mr. Lindley:

(Q.) That is the abnormal at that end. I simply want to take the normal conditions, as we understand them.

154 A. It is going to be very difficult, because the conditions are not very regular anywhere, and the maze of workings interferes, but I will do the best I can.

Q. Can't we serve the same purpose by connecting the extreme western and extreme eastern exposure, which we call the top of the vein?

A. Well, I will get this through there the best I can, I think will answer your purpose.

Now, that very inaccurately represents it. If you wish me to take

more time, I can tie it down to some of the points, but if that will answer so far. Of course, that string should be brought down more, and it is not a straight line in the actual contact, and the string stretches straight.

Now, from this point 7A, where we now have it attached, it is a difficult matter to compare with your question because there is no such line as you mention developed. If I wish to take it across where the probable apex of the south vein is, I can continue the string.

Q. I have laid a pointer on the model. Does that approximately represent the direction of the line of junction between the two veins?

A. Yes, with the explanation that the line is not a continuous line, as is the pointer.

Q. Well, you are connecting—if you are going to take the strike of a vein at the surface, you are going to connect—the average strike, you are going to connect the two extreme points, are you not?

A. If I want the average strike, yes.

Q. Well, does the pointer as it is laid now on the model
155 indicate the average strike?

A. It represents——

Q. In a general way?

A. The average strike of the apex.

Q. I speak of the apex, because it is upon the strike of the apex that rights are defined. Does the way that pointer is laid, approximately, indicate the line——

A. Approximately, but I would like it with that explanation, that through that central section it would have to be represented by two lines. The line of the apex, in my opinion, would continue as a line, one line representing both veins for a distance, and then divides through a section in two lines, and then over here, for instance, (indicating) it would have to divide into two lines because the apex of the north vein is plainly way above the apex of the South vein. So with that explanation, it will serve.

Q. What I wish to get at is the question of the divergence of the two veins, on what you call the strike at the surface or what was originally the surface, and what is now—what we might call the blind position of the junction of the two veins to represent it by that pointer. In other words, you have connected the extreme west end with your extreme east end developments?

A. Yes.

Q. In a general way?

A. In a very general way, yes.

Q. Now, will you kindly refer to your plan map which you testified to, showing a divergence in strike of the vein at the 400 level?

156 A. (Witness does so.)

Q. That is a horizontal map on which the workings are brought up to that level and depicted there, and as I understood your testimony, you pointed out the divergence in the strike?

A. I did.

Q. Of the two veins. Will you kindly take a pointer and indicate

exactly what that situation is in reference to this line indicated by the pointer? Follow the vein—the north and south vein on their contours off the 400 level?

A. The north vein, as represented on the 400 level—the strike of the north vein, as developed in the eastern portion of the mine, would be represented by that pointer, which follows along the drifts from raise 488 to raise 494. The strike of the main West End south dipping vein on the 400 level, while somewhat irregular, could be represented by the other pointer, which I now lay upon the model, pointing towards the stopes at the westerly end, and continuing along through drift 405, drift 429, and on to the bottom of stope 403.

Q. Well, that represents a conical situation, does it not? The south dipping and the north dipping limbs being a solid, and the lines as marked on your horizontal plan indicate that the engineers' strike, or the strike on a level of the two different arms of the—or as you say, the two different veins?

A. It looks as though it could be the top of a pyramid. Were it not for the fact that developments further to the east show that this line is entirely different, it would be quite a—could be drawn
157 to represent the top of a regular pyramid.

Q. Well, a pyramid is supposed to come to a point?

A. These three points, three lines would meet at a point in the upper point, were we to go down.

Q. A pyramid lying on one of its sides?

A. Yes.

Q. Well, that same situation would be obtained as to the engineers' strike on the levels, if that was all one vein, would it not?

A. You could imagine a warped surface where these conditions would exist, yes.

Mr. Lindley: I want to have you make some diagram- for me, and I am trying to get some paper here to have you do that. And the engineers are trying to get it for me.

That is the end of the cross-examination.

The Court has seen that?

The Court: Yes.

Mr. Lindley: You may take it off.

158 Mr. Lindley: I am going to ask you Mr. Wiley to recall your testimony this morning with reference to the conditions shown in one of these raises, and the question asked you by the court just — adjournment, with reference to the south dipping vein, the north dipping vein, and the intermediate conditions there where you said that the quartz dipped vertically. Do you recall that?

Q. I wish you to illustrate that on some paper, that we will have here in a minute and I want you to indicate on that,—draw your own cross section on a pretty good scale—I want you to draw the position of all of the north and south veins in connection with *that* the part of the structure where you say that the course dips vertically.

(Drawing material supplied to witness.)

Q. Now I wish you would put down on the cross section your

understanding of the situation wherein you describe a vertical dipping quartz. You recall the instance?

A. I will do the best I can. It is a very difficult almost an impossible thing to represent that on a cross section. We will assume here that we have the north dipping vein and we have here a south dipping vein. Now they come up more or less like that, I mean to say that this intermediate ground here is silicified and mineralized and fractured in a north and south direction; now the north and south direction—this direction is north and this direction is south (indicating) so we have a view looking to the west the same as all the cross sections so far have been made. The intervening ground is a fracture in the plane on the paper, so that the mineralization and silicification have extended down in this intervening ground, and the quartz has been deposited in the way represented by the blue coloring.

I am not an artist, but perhaps that will answer.

159 Q. You are very modest.

A. Now the raises then have been made up on the one vein and some of them have been made up on the other vein, and there are a series of workings where these two series of workings are connected by a more or less horizontal cross cut, across this underlying quartz. In some cases this underlying quartz along the four hundred has been stoped or evidently has been pay, but in different places there has been litigation workings I believe, they have been termed; they have met and come up, crossed and usually start on a little incline that way, and go off on a little incline that way, as they go towards the other vein, and they form connections in this tract which underlies what we might term the top of the raise there, and they are in quartz following from one vein to the other.

Q. We have there two veins according to your theory uniting on their upward course, and the intervening ligaments or connections or zone of mineralized quartz filling?

A. Not uniting on the upper vein. This quartz which lies in between the two has no south line, so a portion of it can be referred to one vein or the other.

Q. Which portion would you say that quartz belonged to?

A. It belongs to either vein to which it is closest when it has the structure of that vein, and that condition is observable in places, but when we have the cross fractures, and the course is the same you cannot refer it to either vein; there is therefor- no hard and fast line, which separates the quartz of one vein from that of another.

Q. No wall that separates them?

A. No wall in this immediate area. That does not apply everywhere, but in this immediate fracture section.

Q. Why do you give that a vertical dip?

A. That is vertical in the mine.

160 Q. The quartz is?

A. The fracture through the quartz.

Q. The fracture through the quartz. Are those contemporaneous with the formation of the quartz, or post-mineral?

A. I don't know, some of them may have been pre-mineral, as

the fractures as a rule seem to extend up only to the wall; I don't know as to that.

Q. Well, then you did not intend to imply that a condition such as I will illustrate with a black pencil,—I am drawing what I call a roll indicated by the two parallel black lines; you did not intend to assume that any of the veins within that roll dipped vertically?

A. That the structure of the quartz often is vertical; the vein is, perhaps the vein matter you might say, has no dip?

Q. The dip is determined by the wall, is it not?

A. Yes, and this quartz, if you must give it a direction dips as a vein, strikes north and south and dips vertically.

Mr. Dickson:

Q. You are speaking of the intervening country between?

A. Simply of the intervening quartz between.

Mr. Lindley:

Q. When you come up approaching the horizontal and turn to the south that particular quartz which is in the veins stands vertically?

A. Yes, the quartz does not come up and turn over, the way the working does.

Q. In other words you have a horizontal vein?

A. No, it would be more nearly a vertical vein, if you wish to separate the quartz in the vein, possibly.

Q. But you determine a vein and its position and dip and strike by its walls?

A. Yes. That is a hard thing to explain.

Q. Can you explain it?

161 A. Well, assuming that this quartz continues down that far, only, of course the bottom line would be more or less irregular, and mineralization between the wedge, between the two.

Q. That mineralization being contemporaneous as to both the wedge and the veins?

A. Well, it doubtless occurred at different periods of time.

Q. Well I am speaking of successively; whether a successive mineralization or all at one time?

A. Very likely, I think as I said this north and south fracture are so often interrupted by that wall, that possibly that was there before, possibly the wall was there and a line against which it was stuck.

Q. You don't mean to indicate that a north or south dipping vein has a vertical dip?

A. No, certainly not.

Mr. Lindley: Take the witness. Will you kindly mark this as 'Wiley 8' and if you want any responsibility for the curved line up there, you may mark it 'L-I.'

(Sketch marked for identification.)

Redirect examination.

Mr. Dickson:

Q. Now, calling your attention to this sketch marked X-3 which you have made at the request of Mr. Lindley, does that represent occurrences which you met with in the mine in places?

A. Well, that is only a crude representation of the silicification beneath these two veins.

Q. And as I understand that intervening country is fissured and by the intervening country I mean the country lying be-
162 tween the north dipping vein and where it, or the north dipping structure and the south dipping vein with its structure is fissured, shattered, fissures cross latter-ly, at right angles to the general strike of the vein?

A. That is the condition. There is one fact in connection with that which might throw a little light on matters which I did not refer to in my direct,—down on the five hundred foot level.

Q. If you will remember that and bear it in mind I will make a note of it?

A. I just simply say the north and south fractures on that level.

Q. All right go ahead.

A. It is simply that down on this level more than one hundred feet beneath these veins, there is a cross cut which has been run, marked 539 I think.

163 Q. Be sure about it on the model.

A. 539, yes.

Mr. Lindley:

(Q.) So marked on the cross cut.

A. It is filled with quartz from its eastern end, near the drift, to near its western end. The direction of the quartz in that level is north and south, as shown by the red striping upon this cross cut, which otherwise has the rhyolite color, because the country is rhyolite there. It is the highly silicified rhyolite, and in another cross cut just north of the McQuillan shaft, the first one, we have a similar condition only not so intense.

Q. On the same level?

A. On the same level. So that we have this north and south sili'-fication shown beneath the two veins and at a distance of more than 100 feet below the 400 foot level and below either the north and south vein. That is an exceptional vein, and further away than the quartz usually occurs. If you must consider that as a distinct vein, it would have a north and south strike and a vertical depth, but it is probably an irregular mineralization in the footwall beneath the two veins.

Q. Now, I think you said in direct examination that deep down in the mine, far below the junction of these two veins, you find that the replacement of the footwall country has extended as far as 50 feet or more in places?

A. I don't know that I mentioned 50 feet. It has extended a very considerable distance, 20 and 30, and more.

Q. And when you get to the junction, and for some distance below the junction of the two veins, you have the intervening country replaced from vein to vein, from fissure to fissure?

164 A. We have.

Q. Now, that being so, would it be possible to draw any but an arbitrary line of division in this intervening country and say that all to the north of that, the replacement all to the north of that line was due to the solutions that came from the north dipping fissure, and all to the south of that, the replacement of the intervening country was due, referrable to the solutions that came up through the south dipping fissure, or would you simply have to take an arbitrary line, if the mineralization, replacement extended unbroken from one vein to the other?

A. You would have to take an arbitrary line.

Q. There is no other way of doing it. And does that explain why you, in the place that Mr. Lindley called your attention to, where in the raise marked—what raise is that now? I can not see the numbers. What raise is it on the model, or what drift is it, what work is it?

A. I think there is a case where they did not put any number on. But it is the raise which is just above the MacNamara stopes, up to the 200 level and connects with this 203.

Q. Now, you have that working colored for a certain distance in red, and changed abruptly into yellow on the model?

A. We have.

Q. And on that working has the replacement between the two veins extended from one to the other?

A. It has.

Q. And it was impossible for you to refer the mineralization at any one plane to one vein, and any other certain plane to the

165 other vein?

A. That is true.

Q. Now, I want to call your attention to the model, to a piece of work colored in yellow.

A. The top of raise 302.

Q. To the top of raise 303, isn't it?

A. 303 is the vertical part, and 302 the flat part.

Q. Between 302 and 303. That yellow piece of work yellow would appear to have a dip to the south instead of to the north. I understand from the color that that is in the north dipping vein?

A. It is.

Q. And how do you account for that apparent direction to the south? That is the direction of that piece of work in the vein?

A. That is the direction of the raise, and not the vein.

Q. That accounts for that. Now, you spoke, while under cross examination on the sketch, "Wiley X 3," that the litigation work in this intervening country, the work being curvilinear. Which side of the litigation was that on?

A. I refer more especially to the winze, raises, the cross cuts, whatever they may be termed, marked 537, 571 and 573, which were made by the Plaintiff in this case.

Q. Of course, having that—well, that explains itself. Don't need any question, I think. You can give the work driven in any direction, any shape you wish to in that mass of quartz?

A. You could.

Q. You speak of the raise 569 being the most easterly raise. Is it?

166 A. 569 is the most easterly raise that comes up from the main stopes on the west end, but there is another raise further to the east made by the West End people, which connects the stope in the Tonopah Mining Company's ground, where I now place my pointer, with raise 569, following continuously the same vein, and simply making an added connection, showing that the stopes in the West End and the stopes in the Tonopah Mining Company are upon one and the same vein. The same stopes are connected, the two points lower down, so that one now can pass continually through the stope itself.

Q. Now, directing your attention to the work at that model which is fastened on a separate piece of wood here, east of the main frame.

Mr. Lindley: I did not ask him about that. You want to take him on re-direct?

Mr. Dickson: No, but he said in answer to your question inadvertently that 569 raise was the most easterly raise.

Mr. Lindley: I did not examine him on that, Judge Dickson, but he did not seem to know.

Mr. Dickson:

(Q.) Directing your attention to that portion of the model which lies immediately east of the main frame which encloses the model, there is represented in yellow there a raise or a stope going up on a northerly dip. By whom was that work done?

A. That is work of the Tonopah Mining Company.

Q. Does that go up on the north dipping vein or on a north dipping vein?

A. It does.

Q. That was not litigation work?

167 A. That is not. That was mining work, so far as I can observe. It is being stoped in there now.

Q. Was not done by the West End Company, nor by the Jim Butler Company?

A. No.

Q. Your attention was invited in cross examination to a roll or an anticlinal fold in a little stope shown on the model in which are the figures 728 and 724. I will ask you if that roll, if it may be so dignified, is on a contact between differing rocks, or whether you have the same rocks above and below it?

A. Both sides of that are trachyte.

Q. Both the top and bottom?

A. Yes.

Q. Is one side glassy trachyte and the other non-glassy trachyte?

A. No, the workings there show that it is trachyte on both sides.

Q. The same appearance to the eye, too?

A. Yes.

Q. And is there any other feature that you know of, fissuring, slips, that might account probably would account for that anticlinal fold?

A. Well, it is not of sufficient size to properly term it an anticlinal fold. There is a little bend in the stopes, and this is on a branch of the Fraction vein.

Q. Well, is there any fissure or slip on either side of that fold?

A. There are distinct—in fact, there are three distinct fissures in that section, two especially on the north and the south, and it is meeting of these fissures which, in my opinion, make that
168 appearance.

Q. Is it anything unusual in a vein of considerable dimension such as this south dipping vein is to have irregularities of that kind in the lip of the vein, bulges, swells?

A. That is the rule rather than the exception.

Q. There was one other little place that you pointed out to us here as a fold. Where is that?

A. I did not intend to point it out as a fold. I intended to point it out as a place where the north dip was observable in a small working opposite the south dip. It is more properly in comparison with the whole thing just a pimple.

Mr. Dickson: Will you give me, Mr. Clerk, "Wiley's 5"?

Mr. Lindley: Judge Dickson, before you proceed further I have not cross examined this witness with reference to the fraction vein, nor with reference to this south vein that is out on the south. I understand that in this case neither the Fraction vein nor what we call the south vein cuts any figure, except in a geological sense.

Mr. Dickson: That is my understanding, not in this case; it will have nothing to do——

Mr. Lindley: So it is entirely irrelevant to this case, what their dip strike or anything may be.

Mr. Dickson: That is my impression. Is that your understanding, Judge Downer?

Mr. Downer: On the question of extralateral rights.

Mr. Dickson: That will come up in another suit, in which the West End Mining Company is Plaintiff, as I understand.

Mr. Lindley: Yes.

Mr. Dickson:

(Q.) Just a word or two of explanation, Mr. Wiley, of this Wiley Exhibit 5. You were asked in cross examination if this slip or fault which you spoke of was not the only thing that inter-
169 rupted or terminated or interrupted the ore at that point. And I understood you to say yes; I may be mistaken.

A. That is the only thing which interrupts the continuity of the ore at that point along that line. Of course, as a matter of fact, the south vein is interrupted by the entire width of the north vein. But this being the under side of the north vein, it is the only thing that interrupts it along that particular line.

170 Q. Well, now, after that line you encounter the top, or what you call the top of the south dipping vein on its upward course?

A. We do.

Q. And we have there the south dipping structure ceasing at that line?

A. We do.

Q. And the north dipping structure commences at that line?

A. That is what I meant to represent.

Mr. Lindley: Judge Dickson that is rather leading for your own principal witness.

Mr. Dickson: It is only in explanation.

Mr. Lindley: I am a past master in that art myself, and I do not want to make too much criticism.

Mr. Dickson: I agree with you. It depends upon the witness whether it is a leading question, or whether it is objectionable or not, on either side.

Q. Now this feature presents itself to my eye. It looks as though you had above that fault where the red coloring ceases, on this exhibit 5, or continuing upward, the same dip? I wish you would explain that?

A. That is due to the fact, as Judge Lindley says, yellow is a very bad color for that. But the yellow color is not put on heavy there because the mineralization in the ground is not intense in the main part of the north vein it is colored heavier, the structure above there.

Q. Of the fault?

A. Above the fault as indicated here, has a dip of 48 degrees to the north, whereas the south vein below has a dip right there of 49 degrees, and below of thirty degrees to the south. The raise continues up it is true in the same direction it has below, but it is in the nature of a cross cut across the north vein from the point marked 48 degrees, to blue marked on the hanging wall, marked 39
171 degrees, the entire dip there being in a northerly direction.

Q. It being a raise within the north vein?

A. That is, being a raise across the north vein.

Q. Just like the place that you referred to on the model a moment ago, where you had a raise marked yellow and apparently going down on a southerly dip?

A. Yes, a similar occurrence.

Q. Will you direct my attention Mr. Wiley to raise 366 on the model?

(Witness indicates.)

Q. That of course, I take it, is in the north dipping vein, colored yellow is in the north dipping vein?

A. That raise at the top is in the cap. A portion is in the north dipping vein and a portion of it is not colored at all, because I have never been in there and the lower portion is in the cap again. It is rather a peculiar combination.

Q. And below that you have the south dipping vein colored in red coming up?

A. Very distinct.

Mr. Lindley:

Q. Any slip in there between the two?

A. There is a line *if* slipping along back of the raise and that is probably the reason that it is so badly caved.

Mr. Dickson:

Q. Is it your opinion that this country shown on the model between raise 7,—and what number is that 302?

A. The raise is 320.

Q. That undeveloped country there owing to the erosion that had taken place, before the outflow of the andesite, the north dipping vein and the south dipping vein there would not come together on their upward course, that each would have a separate top or apex?

A. That is my opinion.

Mr. Lindley: Scored off?

172 A. Yes.

Mr. Dickson:

Q. That is all. Mr. Wiley read so much of his testimony last evening as had been transcribed and there are some errors in it and some may be due to the witness mistaking the points of the compass, using east instead of west and north instead of south. But there are other errors due to errors on the part of the stenographer. I wish the witness to be given permission and all other witnesses to read their testimony, to make the necessary corrections, and call the attention of counsel on the other side to the corrections made, and then have the stenographers take that corrected copy and correct the original record afterwards. I suppose there is no objection.

Mr. Lindley: That is always done in all cases. And particularly with expert technical witnesses, the terminology being unfamiliar to many reporters, and we always had the witness go over the testimony and make correction- and submit them to the other side. That may be done at any time before the close of the case. Is that correct Mr. Dickson?

Mr. Dickson: Yes, as it should be, I think. Call Mr. Jussen.

Mr. Lindley: One moment please, will you take the stand a moment, Mr. Wiley.

Recross-examination.

Mr. Lindley:

Q. Your statement with reference to the scoring off of this apex is an opinion statement?

A. It is an opinion statement based on the fact that if it had not been scored off, the cap could not have got down below.

Q. Wasn't it very easy to develop that fact and make it a demonstration instead of a matter of opinion?

173 A. There could have been additional work done and there has been work done that shows that the cap has been wore down but the precise line of the apex is not through there. There was, I candidly say, an attempt to develop that made by one raise, 241, and at the point where the red ceases and the violet begins they run into a small fault, and above that was the trachyte, in other words the vein was faulted, and as you dip a little further to the east——

Mr. Dickson: To the west?

A. Yes, further to the west, I would anticipate a very considerable faulting and disturbance and difficulty in actually defining any line on account of this large upwards fault.

Mr. Lindley: That is all.

Mr. Dickson: Call Mr. Jussen.

Testimony of EDMUND JUSSEN, who being called and sworn as a witness on behalf of the defendant, testified as follows, to wit:

Direct examination:

Mr. Lindley: I desire to make the same suggestion, if your honor please with reference to this witness, that he is a competent witness. We know very well of course that counsel won't accept it, but we propose to treat all of your witnesses alike.

Mr. Dickson: Well, I won't spend much time on that. I think fair to the appellate court that if the case is taken there by either side, that the court should learn from the record what the

174 experience of the witness is.

Mr. Lindley: Well the best that you can do on the examination of the witness, as to qualification, is the admission of counsel.

Mr. Dickson: Well, that is not always satisfactory.

Mr. Lindley: Not to the witness.

Mr. Dickson:

Q. What is your full name Mr. Jussen?
A. Edmund Jussen.
Q. What is your age, Mr. Jussen?
A. Forty six.
Q. Where do you reside?
A. Berkeley, California.
Q. What is your business?
A. Mining engineer.
Q. Did you study your profession at any school of learning?
A. I did.
Q. Where?
A. I studied at Freiburg in Saxony.
Q. Did you graduate there?
A. Yes sir.
Q. What degree if any did you take?

A. I took the degree of doctor of natural sciences at Zurich, Switzerland.

Q. When did you graduate?

A. 1890.

Q. Were you a citizen of this country at that time?

A. Yes sir.

Q. You are a native born citizen are you?

A. A native born citizen.

Q. How constantly have you, if at all, followed your profession of mining engineer since your graduation?

A. For the first year after my graduation, I served with the U. S. Geological Survey in connection with economic work in Florida. After that I went to Colorado and started mining at Ward Colorado. From there I went to——

Q. How long was you there?

A. I was there a year.

Q. Go ahead.

175 A. From there I took the management of the Pennsylvania mine in Summit Co. of Colorado. I stayed there until the latter part of 1893, when I went to Idaho in charge of the mines of the Idaho Company, in the interior of Idaho. From there I came to Nevada.

Q. When did you come to Nevada?

A. In 1908.

Q. What part of Nevada?

A. At Blair Nevada, as consulting Engineer of the Pittsburg Silver Peak Gold Mining Company.

Q. Were you in charge of that mine?

A. In the year 1909 I took the general managership of that company. I stayed there until the early part of 1911. Since then I have been in San Francisco and Berkeley, practicing as mining engineer.

Q. Have you examined mines in any countries or states other than you have mentioned?

A. I have.

Q. Just state briefly.

176 A. Arizona, California, Colorado, Montana, British Columbia and Georgia.

Q. In making those examinations which you just spoke about were you employed to make examination or were you simply doing it as a matter of scientific investigation?

A. I was doing it for the purpose of intending purchasers.

Q. You have made an examination of the underground workings of the West End company, that are involved in this litigation?

A. I have.

Q. How much time Mr. Jussen, have you spent in that examination altogether?

A. I made a number of trips to Tonopah. Mf first trip was made in March.

Q. Of the present year?

A. Of the present year; I suppose that altogether I have spent two month- underground in the West End mine.

Q. I will ask you, it may be a leading question,—whether that examination was conducted only by you with a view of determining if you could what was the strike of the veins found in that claim, the West End claim, the dip and the top or tops of the vein or veins as found therein?

A. It was.

Q. Leaving outside a moment the so-called fraction veins, and ommitting also what Mr. Wiley referred to as a branch of the south vein near the west end of the claim,—apart from those how many veins did you find, or do you find in the West End mining claim?

A. There are two principal veins within the west end claim. These vein- converge on their strike and dip in opposite directions; the one dipping in a northerly direction to be known as the north vein, the one dipping in a southerly direction to be known as the West End vein proper.

177 Q. You are familiar of course with the coloring on that model?

A. I am.

Q. Do you from your examination endorse the coloring there which is intended to represent the south vein throughout, as correct?

A. The coloring—The red color represents the south dipping vein, or the West End vein.

Q. Does it correctly represent it according to your examination of it on the ground?

A. It does.

Q. And state whether or not on your examination you endorse the coloring of the north dipping vein as shown upon this model, and upon the other exhibit?

A. I do.

Q. And do you also endorse the coloring on this model, upon the cross section, Exhibit G, which *are* intended to show the enclosing rock, or foot-wall and hanging-wall boundaries of the two veins wherever they have been ascertained?

A. I do.

Q. Is there anything, any feature, any point in the color scheme as adopted in the preparation of that model which does not meet with your approval?

A. There is none.

Q. How would you classify, or how do you classify, the south dipping vein and what character is it?

A. The south dipping vein is a fissure vein, properly speaking. It is a fissure vein in which replacement in the foot-wall country has taken place from the fissure proper.

Q. To what extent,—I mean now in depth of the mine, considerably below the juncture of the two fissures, does the mineralization or replacement extend; I do not mean now where it actually fades out, but where it is not highly mineralized.

A. The distance to which the mineralization has passed into the

foot-wall varies of course, ranging from two feet to as high as twenty-five feet.

178 Q. How do you classify the north dipping vein?

A. I would classify the north dipping vein as a fissure, of a similar type; it is a fissure vein in which replacement in the foot-wall country has proceeded.

Q. To what extent if at all has the process of replacement extended in the hanging-wall country of the south dipping vein?

A. The only replacement of the hanging-wall has been by solutions passing through the fissure of the south vein in places where the hanging wall has been broken by minor faultings.

Q. To what extent has that been?

A. That is observable in only a few places.

Q. What would be your answer to the same question, referring to the north dipping vein, mineralization and the hanging country?

A. There has been no mineralization of the hanging wall country on the north vein that I have observed.

Q. When you started your first examination, I will ask you if any one of these raises,—A-2; A-4; A-5; A-6; A-7, and A-8 had been put up?

A. The only raise that had been put up at the time of my first examination was raise A-5.

Q. How far had that extended upward at the time you made your first examination?

A. About twenty-five feet above the south vein, in the plane of the north vein.

Q. Did you at that time examine that raise, A-5 raise, to the extent it had then been put up?

A. I did.

Q. And in what material was it run; what did it contain?

A. The object of the examination of that particular raise there, and certain other workings on the four hundred foot level, which are in that immediate section of the ground, were to ascer-

179 tain whether or not there was a vein in that section of the ground other than the south dipping vein; 5-A at that time showed a body of quartz, a vein of quartz, extending up into the hanging-wall of the south dipping vein.

Q. The south dipping vein?

A. The hanging-wall of the south dipping vein, for a distance of twenty-five feet, dipping northerly.

Q. You do not mean the south dipping vein, into the hanging-wall?

A. I think that is right.

Q. Just step here and explain what you mean?

A. (Indicating.) This is raise 5-A; this is the south dipping vein; the country in here is the country overhanging the south dipping vein; this raise comes in to the hanging country of the south vein, but on the north dipping vein.

Q. You mean the country overlying—you don't mean that it was run up on the south dipping vein?

A. No, run up on the north dipping vein.

Q. And you refer,—or are you able to state, about the dimension of the quartz that was disclosed in that 5-A, at the time of your first examination?

A. The 5-A raise immediately above the south vein, south dipping vein, was fully two feet of quartz; four feet or five feet above this point this quartz was interrupted by a minor fault of a very considerable throw, probably five or ten inches. From the point it started on upward the quartz increased to a width of fully three feet in the then face of the No. 5 raise.

Q. That raise has been extended since that time to its present top?

A. Yes.

Q. Now how far up the raise does the fault continue?

A. The quartz continues 71 feet, up into the raise and terminates against a small fault.

180 Q. How far is that, if at all, below where that raise as shown upon the model must have encountered trachyte and cap?

A. Trachyte and cap were encountered 271 up in the raise above the hanging wall of the south dipping vein at a point indicated here by the purple in the raise immediately below the green, indicating the cap.

Q. Now did the quartz extend up to that?

A. Extended up to that point; terminated there in a small fault.

Q. Now we will take the A-2 raise, and I will ask you to describe that; what is found in there up to the point where it encounters the trachyte represented on this?

A. 2-A raise is driven on a well defined northerly dipping vein that carries quartz practically from its source into the hanging wall of the south-dipping vein to the present face.

Q. What size what dimensions is the quartz in that raise?

A. The quartz varies from one to three feet.

Q. Do you know whether samples have been taken from these various raises?

A. I understand so.

Q. You have never taken them?

A. No I have never taken them.

Q. Well go on to the A-4 raise; describe that and what was found in it?

A. The A-4 raise is also a raise on the northerly dipping vein; it carries practically continuous quartz to its present face.

Q. What dimensions?

A. The dimensions across there are from one and a half to two and a half feet.

Q. And A-6 raise? What was encountered in that?

A. That is driven on a northerly dipping vein and shows quartz a blue variety of quartz practically to its face.

181 Q. What dimensions?

A. At the beginning of the raise the quartz is fully three feet in thickness.

Q. And at the top?

A. And is somewhat smaller at the top.

Q. A-7 raise, describe that?

A. A-7 raise is driven on a north dipping vein; shows three or four feet of quartz at its beginning above the south dipping vein, but not more than six or eight inches of quartz in the face.

Q. In the top of it?

A. In the top of it.

Q. Will you describe what you encountered in this raise near the east end line of the West End claim, marked on this model 488, if my eyes do not deceive me.

A. Raise 488 is driven up on the *on the* dip of a north dipping vein; carries a large face of banded quartz and encounters the top rock near its top.

Q. Have you been up the stope or raise, whichever it may be in the Tonopah Workings, about the edge of the main frame enclosing this model, colored in yellow?

A. I have.

Q. Is that a stope or simply a raise?

A. That is a stope a part of the way and a raise the balance of the way; it is a stope for about twenty feet in height.

Q. And from the top of the stope upward to where the raise encounters the fault, what have you?

A. This contained quartz to the fault.

Q. Now we come to raise—A. I wish you would describe what is enclosed in that raise?

A. Raise—A is in the McNamara stope and starts out on a northerly dipping vein, showing quartz, not ore, quartz carrying
182 some values. It continues to its face, a distance of about forty five feet.

Q. That does not encounter the top rock?

A. No.

Q. Have you any means of determining approximately, with approximate accuracy how near the top rock it must be from the work in that vicinity?

A. Raise—B, immediately to the north of raise—A, shows the cap rock in the first fifteen feet as its height.

Q. After you get up here?

A. Yes; and raise 152 immediately south of raise—A, and part of the connection between the two hundred level and the Porcupine shaft also shows cap immediately south of raise-A so that the inference can be drawn that the cap is not very far distant from the top of raise-A?

Q. All of these raises then, except raise—A-5 in part have been done since this lawsuit was commenced?

A. Yes.

Q. And for the purpose of preparing the litigation work?

A. Yes litigation work.

Q. How does the dip of these several raises, each and all of them, conform to the dip of the north dipping vein; that is, where the raise connects with the north dipping vein, any change in dip?

A. They are all on the plane of the north dipping vein.

Q. And the ore at the bottom of the raise, or each of these raises, I will ask you is one with——

Mr. Lindley: Now I think I will have to call a line on the leading questions there?

Mr. Dickson: That is not a leading question.

Mr. Lindley: That is pretty leading.

Mr. Dickson: I asked him whether or not,——

Mr. Lindley: I am not going to make any hard and fast objection, but kindly avoid it with a witness of this man's prom-
183 inence. He does not have to be led.

Mr. Dickson: If you think that it is leading I will try and obviate that objection. I will try and observe the rule.

Q. You may take your seat again for the moment. I wish you would describe to the court giving as clear a description as you can, of the relation of the ore or quartz at the bottom of each of these raises, and up the raise, as compared with the quartz and the ore in the north dipping vein which goes on down evidently continuously from the bottom of these several raises.

A. The quartz in all of these raises on the north vein is like all of the quartz in the West End mine, it looks alike, it looks identical with most of the ore that is now being mined in the property.

Q. What is there if anything so far as your observations that can lead you to determine the question, to distinguish, or which does distinguish, the contents of a vein material found in these several raises from the vein material or ore found in the north dipping vein immediately below, and in connection with the bottom of the several raises?

A. The quartz of the north dipping vein shows banding and it shows certain littles seams of quartz of a different color, which pass over the quartz of the south dipping vein.

Q. Just pay attention to the question.

(Question read.)

A. You mean by that the difference in the quartz?

Q. I will try and put it in another way.

A. I did not get that question.

Q. What is there, if anything, which distinguishes if at all, the vein material or quartz found in these several raises and the vein material, quartz and ore as found in the north dipping vein immediately in conjunction with the bottom of the several
184 raises?

A. Why the quartz appearing in these several raises on the north dipping vein is identical with the quartz occurring in the north dipping vein beyond the blow below the bottom of these raises.

Mr. Lindley: One moment; that question has not been answered, as I understand it the answer limited itself to the quartz. Have you finished answering the question? Read the question please.

(Question read.)

Mr. Dickson: Now read the answer.

(Answer read.)

Mr. Dickson:

Q. Do you wish to add anything to that?

A. Yes. The vein material in addition to the quartz is chiefly trachyte, and it is of the same appearance below the bottom of these raises as it is in the raises themselves; the hanging-wall of the north dipping vein is prominent in all of these raises, and carries considerable clay or selvage and shows the markings that ordinarily go with that movement.

Q. I will ask you if that is of frequent occurrence through out the workings of the mine?

A. Yes, that same condition exists in the south vein; there are portions of the wall of the south vein which also show considerable clay and breccia, which has been produced by movement.

Q. Is there anything as you pass from the stope in the north dipping vein up into raise A, or from the north dipping vein up into the other raises, that have been named, to lead you to suppose that as you went into those raises you are passing out of the north dipping vein into another vein. If so, what?

185 A. Going up from the four hundred level——

Q. Do you understand the question?

A. Yes. In going up from the four hundred level to raise 494——

Q. Where is that?

A. (Indicating.) or through raise 496 over the top of the south dipping vein and into the raises given on the north dipping vein, the quartz passes through the quartz which dips south at the bottom of these raises; may I have the question again?

Q. What if anything is there as you pass from the stopes in the north dipping vein, or as you come up the north dipping vein from the bottom of these raises and pass up into the raises, to indicate when you start up those raises that you have left the north dipping vein and go into a separate vein?

A. Why the continuity of the quartz above the south dipping vein.

Q. You do not understand the question yet. Is there anything, if you will permit a leading question Mr. Lindley.

Mr. Lindley: Yes, go ahead.

Mr. Dickson:

Q. Is there anything to indicate to you as a mining engineer that when you pass out of the stope here into the south dipping vein, and go up into any one of these raises, that you have gone out of the north dipping vein into a different vein, or is it the same vein?

A. It is the same vein.

Q. The quartz that you have testified to as having been revealed by these several raises, state whether or no in them is quartz or rock in place as originally deposited, or had been dragged there to where it is now from some other source?

186 A. The quartz showing in the raises on the north dipping vein is in place, certain portions of the quartz near the foot lines show that it has been fractured and dragged more, but generally speaking it is all in place.

Q. This No. 5 raise which you say was there when you first commenced your examination—did that look then like new or old works?

A. Old work.

Q. You say that was the only raise of those mentioned that had been put up before your examination. I want to ask whether or not you know raise 488 above raise 569?

A. Raise 5-A was the only raise above the opening, 400-B stope. Raise 488 at this point had been put up half way before I made the first examination.

Q. About how far?

A. About thirty-five feet.

Q. Did that look then like new work?

A. It was old work.

Q. It was old work also?

A. Yes.

Q. And state whether or no for a distance that it had then been driven out it was on the north dipping vein?

A. It was on the north dipping vein.

Q. I wish you would describe the appearance of the hanging wall of the north dipping vein as it passes above the top of what you call the south dipping vein,—whether it is well defined or not?

A. The hanging-wall of the north dipping vein as it passes from the south dipping vein is well defined.

Q. Explain its appearance as best you can to the court?

A. It carries considerable gouge and attrition matter and quartz; quartz that is banded parallel to the hanging wall itself.

Q. Speaking of the country interveining between the two veins the north dipping and south dipping veins, at the plane of junction and for some distance below that junction—explain to the court the extent if at all that it has been replaced?

187 A. The country underneath and between the north and south dipping veins has been mineralized, or rather silicified for considerable distance; this section of country extending between the 7-A raise on the west and the 488-raise on the east is a country of intense silicification, it is in that section of the country that the silica has extended in places to from one hundred feet in the veins themselves, into the foot-wall country.

Q. To what extent immediately below—what I mean by immediately below the plane, the junction of these two veins, we will say forty or fifty feet below, to what extent has the intervening country between the two veins been replaced by the mineral bearing solution?

A. The country immediately underneath the south dipping vein has been replaced for a varying distance in places as far as forty feet; the replacement on the hanging wall also reaches into the foot-wall fifteen or twenty feet.

Q. Well, is there any place below the point of junction of the two

veins, where the intervening country has been replaced from one vein to another?

A. Yes.

Q. That is what I wanted to get at. Did you observe the character — the condition of that intervening country? We will say thirty, forty or fifty feet below the line or plane where these veins unite; have you observed the condition of the intervening country,—I mean by its condition, is it solid or broken or fractured appearance?

188 A. Yes. The country intervening between these two fissures has been sheared by fissures running practically north and south, having a slight dip to the east.

Q. Extending nearly vertical, do you mean?

A. Extending nearly vertical.

Q. Can you state from your observation or your knowledge and experience as a mining engineer whether or no, in a rock that was at all soluble so that it could be affected by the mineral metal bearing solutions, giving effect thereby to the replacement, conversion of the country rock into ore, whether you would expect such replacement to extend farther from the main channel of circulation, where the country was broken, fissured, than you would if it were solid, unbroken?

A. The replacement of the country rock between the fissures has proceeded along fracture lines, and through the—and gradually replaced the rock itself.

Q. I understand. My question is whether you would expect the process of replacement to extend further out into the footwall country, or the country rock where that rock was broken and fractured, than you would if it were solid and unbroken?

A. Why, most assuredly.

Q. Have you investigated with care, Mr. Jussen, the places where observation was possible, the appearance of the south dipping vein where it came in connection with, or joined the north dipping vein?

A. Yes.

Q. Describe some of those places where you have observed them?

The Court: Mr. Dickson, that is a new subject, and it is

189 recess time. Do you want a recess?

Mr. Dickson: I would like a recess, yes.

The Court: This case is continued for ten minutes. You may declare a recess for that time, Mr. Bailiff.

(Short recess taken.)

The Court: Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Mr. Dickson:

(Q.) Are you feeling all right now?

A. All right now.

Mr. Dickson: Read the last question.

(The reporter read the last question.)

Mr. Dickson:

(Q.) And show what the structural conditions of the two are?

A. The south dipping vein stops against the north dipping vein, then at the bottom of all of the raises that have been driven between the east end line of the West End claim, and the last westerly raise, driven from head of the MacNamara stope.

Q. Called raise A?

A. Called raise A. The stopping of the South dipping vein against the north dipping vein is simply the ending of the south dipping structure against the north dipping structure.

Q. What difference in structure of the two veins do you have in such places?

A. The only difference of structure is that one dips north, the other one dips south. The quartz in both veins is identical.

Q. Is that an abrupt or gradual change from a southerly
190 to a northerly dip?

A. That is an abrupt change from a southerly to a northerly dip.

Q. Has there been in any of these raises clear up to the top of them any considerable, or any oxidization that you have observed?

A. That is no oxidation that I have been able to observe in the top of these raises.

Q. How is it throughout the mine, generally, in that respect?

A. It seems to be—whatever oxidation is found in the mine seems to have occurred without any particular rule or reason. You may find in the heart of a body of ore an oxidized portion, an oxidized streak. Then again, you may find a certain amount of oxidation in connection with the Brougher dacite cut in the western portion of the mine.

Q. Where, if there is any place where you would observe a greater amount of oxidation than elsewhere in the mine, point it out?

A. The only places of greatest oxidation in the mine occurs on the 600 and 500 level, where the workings pass into the Brough-Mountain dacite. There is very litle oxidation shown in the vein proper.

Q. Apart from that?

A. That is not ore, that is country rock cut by this.

Q. I am speaking more particularly of the ore, the vein matter?

A. There is so little oxidation that it is a very difficult thing to tell where most of the oxidation took place.

Q. There have been some major faults spoken of here, such as the Edwards fault?

A. Yes.

191 Q. And the buried fault. State whether along the plane of either one of those major faults there is any evidence that surface waters, as well as the air could come down through the faults?

A. There is a little evidence of oxidation in a north and south striking fault which cuts through a cross cut driven from the 500 foot Tonopah level, and which shows in certain portions of the Jim Butler workings. Within that fault there is some evidence of

oxidation and the fault itself seems to carry—the fault itself carries a great deal of water.

Q. How is that?

A. The fault itself carries a great deal of water.

Q. That would be surface waters, of course?

A. Surface waters. But there is in other places, there is very little oxidation.

Q. Where you have that channel of circulation for the surface waters, that particular fault you are now speaking of, of course, that would give access—there would be access for the air, too?

A. There would.

Q. To what extent does oxidation go on there? Is it limited or extensive?

A. It is limited. It affects simply the rocks cut by the fault in the immediate vicinity of the fault.

Q. Have you formed a conclusion, or reached a conclusion as to what the strike of the south dipping vein is, Mr. *Mr.* Jussen?

A. The strike of the south dipping vein is about 10 degrees north of east and west.

Q. True or magnetic?

192 A. True.

Q. And what, in your opinion, is the strike of the north dipping vein?

A. The strike of the north dipping vein is about 40 degrees south of east and west.

Mr. Lindley: One moment, where is he taking these strikes, at the nearest point to the surface, or on a level?

Mr. Dickson: I was speaking generally of the underground workings.

Q. Take it at the top, as far as it can be determined at the top, about what would be the strike of the south dipping vein.

A. You mean where the south dipping vein joins the north dipping vein?

Q. Yes; taking it through its extent, so far as the top is developed. Get at it this way: what is the general strike, take it at its westerly end and easterly end, as disclosed, what is the average strike of the south dipping vein at the surface?

A. The average strike of the south dipping vein, taken along the line where it adjoins the north dipping vein is about 10 degrees south of east and west.

Q. So you are speaking of the plane of junction when you give——

Mr. Lindley:

(Q.) South of east and west?

A. South of east and west, that is, if one may express it that way. Express it that the strike of that vein from the top of the MacNamara stope to where it crosses the east end line of the West End vein is about south 80 degrees east.

Mr. Dickson:

(Q.) And the strike of the north dipping vein as to plane
193 of junction is about what?

A. The strike of the north dipping vein at the plane of junction is about the same.

Q. About the same as what?

A. The same the strike of the south dipping vein.

Q. What is the average dip of the south dipping vein at the west end of the development?

A. The average dip of the south dipping vein at the west end of the development is about 30 degrees.

Q. And what is the average dip of the south dipping vein at and in the vicinity of the east end line of the West End claim?

A. About 17 degrees.

Q. And about what is the dip of the north dipping vein, so far as that vein has been developed?

A. The north dipping vein, near the east end line of the West End claim, dips approximately 17 degrees.

Q. How much?

A. 17 degrees.

Q. Have you reached a conclusion, Mr. Jussen, as to where the top of the south dipping vein is?

A. The top of the south dipping vein is underneath and adjoins the north dipping vein, and continues from the east end line of the West End claim to and beyond the raise "A," driven from the head of the MacNamara stope.

Q. And where does it go then?

A. It passes from there into—or passes from there a short distance in a westerly direction to a termination against a mass of eruptive rock.

Q. Does it cross any other line of the West End claim
194 than the east end line at its top?

A. It crosses the north side line of the West End claim.

Q. Have you made any attempt to fix approximately at what distance from the east end line, measured along the north side line, that vein and its top crosses the north side line of the claim?

A. I have simply endeavored to determine the place on the north side line where the south dipping vein crossed the north side line of the West End claim. The distance on the side line from any one of the corner- was not measured by me. That was given to me by the engineer—the distance of that point from any one of the points.

Q. Can you point out on the model approximately where, in your judgment, the south dipping vein at its apex crosses the north side line of the West End claim?

A. About 8 feet north of the foot of the 150 raise.

Q. I will ask you if between raise 7A, and what raise is this?

A. 302.

Q. The top or apex of either the south dipping vein or the north dipping vein is disclosed, actually disclosed, uncovered?

A. There are no workings actually disclosing the top of that in that distance.

Q. That would be a matter of calculation from the places where it has been disclosed on either end to determine whether the top of either of them would be found in that place?

A. It would.

Mr. Dickson: You may cross examine.

195 Cross-examination.

Mr. Lindley:

(Q.) Mr. Jussen, you are somewhat of a geologist, as well as a mining engineer?

A. I have done some geological work, but principally such geological work as pertains to structural problems.

Q. Do you make a specialty at times of rock examination?

A. I do not.

Q. You have in the past, have you not?

A. I have made rock examination, yes.

Q. Have you made any thin sections of these rocks?

A. Not personally.

Q. You have not personally?

A. Not personally, no sir.

Q. Take cross section B. You there have a read and a yellow vein. Will you tell us how that happened?

A. Well, if you want to indulge in speculative geology, I think that I can give you my views on the subject.

Q. Well, I would like to have your views.

A. A certain strain brought about in the trachyte rock mass West End through the introduction or intrusion of *waste under* rhyolite. These strains brought about a formation of a fissure, the south dipping fissure. As these fissures continued, a north fissure was formed projecting up and beyond the south dipping fissure.

Q. They were not formed at the same time?

A. I think not. They may have been fissures formed during the same cycle of fracturing, but not at the same time.

Q. Well, is it your idea that this represented in red here
196 was formed first and stopped there?

A. I do.

Q. And then this other fissure was formed and stopped there?

A. Went beyond; for the reason that it reached—I beg your pardon, I will stop my answer right where it was.

Q. Well, you do not care to indulge in any further speculating geology at that point?

A. I simply carried it to that point.

Q. We are in a homogeneous rock there, aren't we?

A. In that particular section, you are in a trachyte.

Q. Then, as I understand you, the fissure up to the blue line was first formed?

A. Yes.

Q. Then, this other fissure was formed?

A. Yes.

Q. When was it mineralized?

A. I think that the south vein was probably mineralized prior to the formation of the north dipping fissure.

Q. Separate periods of mineralization?

A. Yes.

Q. Was there any—in other words, the south dipping fissure was mineralized before the north dipping fissure was formed?

A. It has that appearance, through the structure that is shown where the south dipping fissure terminates against the north dipping fissure.

Q. Now, at that point of termination, is there any faulting?

197 *Q. Now at that point of termination is there any faulting?*

A. There is faulting but it is minor.

Q. Does it displace the vein?

A. I should say not.

Q. It does not?

A. Not in the plane of the vein.

Q. There is nothing to indicate a physical and distinctive origin of the two on the ground?

A. There are fractures which are parallel to the course of the north dipping vein against which the south dipping vein terminates.

Q. Is it your idea that that is all there ever was of the south dipping fracture?

A. It looks that way to me.

Q. In other words in an upward direction to be followed, that crack simply extended up there and stopped?

A. I think that north dipping vein never extended much further than it is shown in the workings now, the south dipping vein.

Q. In other words that crack terminated there, and there was another dynamic force which began?

A. Another dynamic force of the same course or another period which created the same fissure.

Q. When you are speaking of contemporaneous origins, do you think they are contemporaneous?

A. I do not. I think they are of the same time.

Q. Is there any evidence of movement of the secondly formed fissure as against the vein cutting off this vein or coming up against it?

A. You mean on the plane of the north vein?

Q. Yes.

A. The hanging wall of the north vein shows a heavy gouge which is unquestionably the result of movement.

Q. Is that shown in connection with the south dipping vein?

A. The south dipping vein does not show as much gouge

198 as a rule — north dipping vein.

Q. Is there any gouge along the plane of faulting between the two?

A. There is very little gouge; you will find occasionally in the course of the vein, the course of the points of joining that there is a small fault or throw which may be four or five feet but beyond that there is no extensive faulting.

Q. I have reference particularly to the place where you say that this original mineralized vein was first formed, and the first mineralizing ceased, and a subsequent fissure came up, against it. I am asking you along the first terminal edge of that vein if there is any sign of a movement?

A. There is a little gouge shown in places.

Q. I am confining you directly to the plane formation between the walls?

A. That is what I am referring to.

Q. There is gouge there?

A. There is in places.

Q. At that particular point?

A. At that particular point on that section there are one or two small gouge seams.

Q. The gouge is not continuous?

A. No, I should say that in the next raise the seam which shows in this particular line or section might not occur above.

Q. Might not occur at all. How is it about the gouge in these raises that were cut up? Any gouge there?

A. There is a little gouge in foot of the raise, just above the south dipping vein, but that gouge belongs to a fault or a series of faults, that strike in a northerly and southerly direction.

Q. We will turn to another cross section. Cross section C;
199 you have a vein painted red and one painted yellow, can you tell how that happened?

A. Precisely the same way that the other fissures were formed.

Q. Well, this cutting off of this south dipping vein that you spoke of shows clear along the strike of that vein does it?

A. Every place that I have observed it.

Q. Clear along that strike?

A. Yes.

Q. There must have been some extensive movement there?

A. Not necessarily.

Q. In other words you confine these things in just this juxtaposition without any serious movement?

A. I can understand how two fissures can be foremd, and not——

Q. We were dealing in the last cross section with homogeneous rocks, where the two fissures were made. I now call your attention to section C where apparently on the line of contact between,—that happened in the same way?

A. I should say so; the fissures in their course struck the line.

Q. In other words a fissure strong enough to throw out into the hard eruptive rock passed and crossed this south vein, without showing any attrition at the point where they crossed?

A. I don't believe that we understand each other.

Q. Well if you cannot answer my question it is your privilege to say so. Will you please read my question Miss Reporter?

(Question read.)

Q. Can you answer the question?

A. I can.

200 Q. Please answer it?

A. I don't see why there is not a termination to every fissure at their depth; a fissure is simply nothing but an expression of a series of tensions, the *the* result of the expression of tension in rock; now when that tension ceases the fissure ceases. That fissure need not extend indefinitely in the supra imposed country. Now as a relation to the north dipping vein which in that portion, its course follows the contact of the rhyolite and trachyte, I could say that the fissure could very readily extend to and above the south dipping fissures without very much faulting. It can be a fissure without any material displacement.

Q. Are you satisfied with that answer?

A. I am.

Q. Have you studied the system of faulting in connection with the origin of these veins, or their present status with reference to faulting?

A. I have studied faults of the mines, and their relation to these particular veins.

Q. Did you ever hear of a fault called the palaris fault?

A. I have.

Q. Where is it with reference to this vein?

A. I think that the palaris fault is simply a term that was at one time given to the north dipping vein.

201 A. Well,—never in a public manner that I know of.

Q. Never heard of that term Polaris fault by the employees of the West End Company?

A. I have, in a joking way.

Q. In a joking way?

A. Yes.

Q. Did you ever hear of a fault called Siebert?

A. I have heard of such a fault.

Q. Have you ever read about it?

A. I have read about it.

Q. You have read Mr. Spurr's monograph on this district?

A. I have, some years ago.

Q. Not in connection with the trial of this case?

A. No.

Q. Have you read Mr. Burgess' monograph on this district?

A. I have.

Q. In a recent period?

A. No; about a year ago.

Q. Is there any major faulting in your examination in this mine that at all affects, according to your observation, this vein in any way, shape or form?

A. There may be, but it is not in the plane of the north dipping vein.

Q. You do not think that all your upraises here run on a fault plane?

A. I do not.

Q. You are quite certain of that are you?

A. I am perfectly positive.

Q. Have you ever undertaken to trace the line of the wall that is exposed in those upraises out into any other section of the
202 country?

A. Nothing beyond the workings of the Tonopah Mining Company, adjoining the easterly end lines of the West End claim.

Q. Ever undertake to trace it out into the west country?

A. Not into the crater which terminates the MacNamara stope on the west.

Q. Crater? Have we a crater there?

A. A little mass there of eruptive material that unquestionable is the product of eruptive activity.

Q. I do not under-tand your designation. What do you mean by a crater?

A. A volcano.

Q. The neck of a volcano?

A. A portion, not necessarily the neck.

Q. The crater is usually the mouth where the molton lava is poured out.

A. That is true.

Q. Do you consider this a crater in the sense that that is where the molten lava was poured out?

A. Not the neck necessarily that particular part; it may have been part of the lava that was poured out from a neck located somewhere else.

Q. It may be an eruptive and not a flow?

A. It may be a flow and not necessarily a crater.

Q. You have not undertaken to follow out these walls out into the west country?

A. Not at all.

Q. That vein terminates abruptly?

A. In the westerly portion of its course.

Q. That is true of the veins, both north and south?

A. True of both the north and south veins.

203 Q. That is the end of it?

A. That is the end of the vein, north and south; the north vein continues considerably further to the west than the south dipping vein.

Q. Cutting something in the form of a crescent, in a rough way?

A. In a rough way, yes.

Q. Is that all you know about the dynamics in these faults that you have now explained with reference to these veins?

A. The appearance of the north vein,—the question of simple faulting on the plane of that vein has been investigated by me in a rather thorough way; I fail to see there has been very much displacement on the plane of the north vein, either overthrows or faulting.

Q. You were asked on cross-examination about an illustration as to the included mineralization between the two veins. That mineralization does exist between the two veins and extends from one to the other?

A. In place.

Q. Where did that mineralization come from?
A. From the fissures themselves.
Q. Which one?
A. Either of the two, or both.
Q. And that condition prevails to what extent throughout the mine?
A. It is common with the summit of these two veins; that is, to all the ground or rock that immediately underlies the summit of the north and south veins.
Q. Do you find the same conditions existing along the foot-wall in the Jim Butler-West End workings in the west end of
204 the mine?
A. There is very little of that silicification in the west end of the mine on the lower levels in the foot-wall country.
Q. Do you know the 712 cross-cut in the east section of the country?
A. I understood you in the west section of the country?
Q. Yes, in the west section too.
A. The 712 cross-cut,—yes.
Q. You find the same condition there?
A. I find that *that* this place where you speak of shows that the silicification is a part of the south dipping vein.
Q. Well, take that entire cross-cut, under the stopes, or beyond the stopes; do you find the same situation as to mineralization there as you say in this iilustration between and underlying the two veins?

Mr. Dickson (int.): You mean extending from one vein to the other?

Mr. Lindley: No; underneath the south dipping vein, in the hanging wall of the section; either in the hanging or the foot.

A. Of the West End vein, or the Jim Butler vein?
Q. Well, the Jim Butler vein, we think it is; the south dipping vein. Don't you find that same silicification, mineralization and condition in that section of the mine, in the hanging country, that you have testified to as existing underneath what we call the crest of the anticline?
A. I have not found any silicification in the foot-wall or hanging-wall of the West End vein in its downward course only in
205 such place where separate and branch veins have been cast off by the south vein.
Q. Do you recall what you saw going through that 712-cross-cut?
A. I do.
Q. And do you now state there is not anything in there except barren country rock?
A. This stope here, is a portion of the vein proper.
Q. Take the cross-cut throughout its entire length.
A. This portion of the cross-cut, the end, practically, of the cross-cut, 712,—there is considerable silicification back in the foot, but that is not in any way connected with the immediate foot-wall of the south dipping vein.
Q. Well, it is somewhere near the vein, isn't it?

A. Vertically, I should say, 40 or 50 feet below it.
Q. Connected with the vein, isn't it?
A. Not that I know of.
Q. Well, there is no opening there?
A. No opening that I can see.
Q. Well, is it your opinion that it is connected with it?
A. I would not venture that opinion as there are several places in the West End and in the Butler ground where there are masses of silica that are not necessarily connected with either vein.
Q. You would not venture an opinion on that?
A. No.
Q. When you say these two veins come up together abruptly, what do you mean?
A. I mean one terminates abruptly against the other.
Q. Well, what do you mean, abruptly, as to angle?
206 A. Well, the south dipping vein,—the structure of the south dipping vein terminates against the structure of the north dipping vein.
Q. Any difference between those two structures?
A. No material difference.
Q. Any difference in the vein filling?
A. Both of them are banded quartz.
Q. Any difference in the vein filling of the two veins?
A. None.
Q. Could you tell either of them apart unless you knew where they came from?
A. No.
Q. Now I wish you would examine these stopes up here in the west end of the mine, in the neighborhood of what is marked here "Raise A," where I find the yellow and the red joined here by a line. Is that an arbitrary line or does it designate a distinct physical parting between the two? I am calling your attention to the line of demarcation between the red and yellow in the stope underneath Raise A.
A. There is a little faulting of the hanging wall at that place.
Q. How do you designate faults on this model?
A. In blue.
Q. There is no blue mark there?
A. No, but there are a number of other faults that occur that probably are not marked on this model,—small faults.
Q. That line of parting exists,—you are sure of that?
A. There is a line of parting there.
Q. And on that line?
207 A. Practically on that line.
Q. Practically on that line?
A. Yes.
Q. You call that an abrupt intersection as indicated by the line connecting the red with the yellow. Is that what you mean by an abrupt intersection?
A. No, not at all.
Q. That is not abrupt there?

A. No.

Q. Tell me a point in the mine where it is abrupt.

A. In either one of the raises above the 400 G stope,—raises 2A, 4A, 5A, or 6A, or in either of the raises below the 400-ft. level of the eastern portion of the property.

Q. Raises 571 and 573,—is that abrupt?

A. Raises 569, or 573, is an abrupt termination.

Q. Is that any more abrupt than the termination in the west end of the MacNamara-West End stope?

A. It is.

Q. Is there a physical line of demarcation there?

A. Yes, there is a line of physical demarcation.

Q. What is it?

A. Simply the end of quartz of one particular structure as against the dip,—as against the quartz of the other structure and dip.

Q. I understood you to say there is no difference in the structure.

A. There is not.

Q. How can you tell when one structure begins and the other ends?

208 A. I mean as relates to the dip?

Q. In other words, they are different veins because they have different dips?

A. That is not the only difference.

Q. Then, make your explanation. I asked you how you could tell where one structure met another and there was no difference in the structure, how you could determine there were two?

A. The structure of the north dipping vein is in parallelism with the hanging-wall of the vein; shows a decided banding. The south dipping vein,—the structure of that is also parallel to the south dipping vein. Now when these two met and the dips changed, when they met and terminated one against the other, there was a seepage of one as against the other.

Q. How do you know that they met?

A. It is visible in the mine.

Q. Because there is a change in the direction of the dip?

A. Not only a change in the direction of the dip, but a change in the dip of the structure.

209 Q. Well, there must be a change of the dip of the structure if there is a change in the dip?

A. That is right.

Q. Obviously?

A. Yes.

Q. I cannot appreciate—Perhaps you have a clear notion of what you are testifying to, but I have not been able to get it through my head yet. I want to know what there is there to indicate that that is two veins instead of one vein?

A. As you pass up on the plane of the south dipping vein the quartz shows a banding parallel to the hanging wall of the south dipping vein. When you reach the north dipping vein, this banding of the South dipping vein quits against the north dipping banding of the north vein.

Q. How do you know it quits?
A. It is visible, plain to be seen.
Q. In other words, there is a change in the direction?
A. Change in the direction.
Q. Is there any physical interruption?
A. Nothing more than a slight breaking of the quartz.

Mr. Lindley: That is all.
Mr. Dickson: That is all. I may have one or two questions in the morning. I do not know that I will. It is hardly worth while calling another witness.
Mr. Lindley: One moment, please.

Q. What do you understand to be the meaning of the word "strike"?
A. It is the course of a vein on a level.
Q. Course of a vein on a level. Is this apex tracing of yours on a level?
A. No.
210 Q. It is a plunging line, isn't it?
A. It is an easterly dipping line. It is a line such as you would naturally expect would be the line of intersection of two converging planes.
Q. Well, it is not a course on a level?
A. No.
Q. And when you use the term "strike" in connection with your testimony, you mean the strike of the vein on a level?
A. I mean——
Q. The course of a vein on a level?
A. At right angles to the dip.
Q. There is a difference, then, is there not, between a course and a strike?
A. Well, the term has been used in the same sense.
Q. Well, the course of a vein on a level and a strike are coincident?
A. I should say that the strike of the vein was the intersection of the plane of the vein with the horizontal plane—the line of intersection of the plane of the vein with the horizontal plane.
Q. The course on a level?
A. Course on a level.
Q. It must be if you are on a horizontal plane?
A. Yes.
Q. And then the course of this apex is downward—If that mountain, the original surface was restored there, you would find the apex tracing going up hill from the east to the west, wouldn't you?
A. If that mountain were restored there——
Q. If the cap was taken off?
211 A. The apex line would be practically horizontal; have a very much slighter dip to the east than it has now.
Q. By removing the capping, you will say that it would be horizontal?

A. The capping simply accompanies the faults that have created the minor distortions in the veins.

Q. Well, how does that help us out? What is your conception of this thing in the original, that these veins were created before this trachyte flow, is that right?

A. No, I don't think they were created before the trachyte flow. They are in the trachyte in places.

Q. Well, what is your last rock, your andesite? What do you call your capping?

A. There are two forms of capping; one is an andesite and the other is a dacite.

Q. Well, I should have said dacite; the Brougher Mountain dacite, you call it?

A. Yes.

Q. That was your last flow, and that flowed from the surface, didn't it?

A. It did.

Q. And that surface is now represented by what on this model?

A. By the lighter green color.

Q. By a lighter green color. Well, isn't it apparent from that, if you take that capping off now and restore those conditions, that your line of apex ascends up hill from the east to the west of your so-called apex?

A. The line of intersection of the north and south dipping veins must, necessarily, ascend going West.

Q. Well, then, it does. That is what I asked you sometime ago.

212 A. The line of intersection of any two converging planes is bound to drop in one direction. If they were parallel it would be a horizontal line.

Q. Well, can't you conceive of two veins coming up and the course of the intersection being absolutely horizontal?

A. If they are parallel.

Mr. Dickson:

(Q.) Parallel in strike, do you mean?

A. Parallel in strike.

Mr. Lindley:

(Q.) But the strike of one vein in this case is the strike of the other?

A. Not at all. They are converging strikes.

Q. Well, I understood you to define the strike of the red vein,—first define the strike of the yellow vein and then the red, and then I understood it was the same. Didn't you so state?

A. I did not define the strike of the yellow vein as being in the same direction as the strike of the red vein.

Q. Then I misunderstood you.

A. I said they are converging veins.

Q. So they converge on their upward course, and, according to your notion, they converge on their strike?

A. On their strike at an angle of forty degrees.

Mr. Lindley: I may have a question or two in the morning. It is now the adjournment hour.

The Court: This case is continued until to-morrow morning, at ten o'clock.

213 5.

Third Day, Morning Session.

T-URSDAY, December 10th, 1914—ten o'clock a. m.

The Court: The Jim Butler Tonopah Mining Company, vs. the West End Consolidated Mining Company.

Mr. Dickson: Call Mr. Chandler.

Testimony of JOHN W. CHANDLER, who being called and sworn as a witness on behalf of the defendant, testified as follows, to wit:

Direct examination.

Mr. Dickson:

Q. What is your full name Mr. Chandler and your age?
A. John W. Chandler. Age thirty-eight.
Q. Where do you reside?
A. Tonopah.
Q. How long have you lived here?
A. Altogether about eight years.
Q. What is your business?
A. I beg your pardon?
Q. What is your business?
A. Mining Engineer.
Q. Where did you study your profession?
A. School of mines of Colorado.
Q. Did you graduate from that school?
A. I did.
Q. When?
A. 1901.
Q. How constantly have you followed your profession since your graduation?
A. I have followed it constantly since that time.
214 Q. Where first?
A. In Colorado for a short time. In Utah for a short time and since that time in California and Nevada.
Q. What mines in Utah?
A. A mine called the Midas, in the Deep Creek country.
Q. *Are* others in Utah?
A. Any others you say?
Q. Any other mines in Utah?
A. I was not connected with the management of any other.
Q. Did you examine any other mines in Utah?
A. Yes, a number.

Q. And from Utah where did you next engage in the practice of your profession?
A. In California.
Q. How long in California were you so engaged?
A. About two years.
Q. And do I understand that from California you came to Nevada?
A. I did.
Q. And in what portion of Nevada have you practiced your profession chiefly?
A. In this camp.
Q. In Tonopah?
A. As far as the operating end in concerned.
Q. You have examined mines I take it by that elsewhere in the State?
A. Yes, throughout the state.
Q. Your operating experience has been practically in the Tonopah District?
A. Yes.
Q. When did you first come here Mr. Chandler? When did you first engage in the practice of your profession?
A. In Tonopah? I think about the latter part of 1904. I would not be certain as to that date.
Q. And continuously since that time?
A. No I have been absent from the camp for about three years, returning a year ago last October.
Q. With the exception of that three year period you have
215 been engaged in your profession here?
A. I have, since 1904.
Q. Have you examined many of the mines in the Tonopah District?
A. Yes.
Q. Most of them?
A. Yes, most of them not in the nature of a complete examination of course, but I have been underground in most of the mines of the camp, and have spent considerable time in some of the properties.
Q. What was your purpose or object in visiting or examining the other mines, which you were not directly connected with?
A. To learn the general conditions of the camp, and the geological conditions of the camp.
Q. How many mines have you had charge of in Tonopah?
A. Well, I have had charge of the McNamara the West End, Halifax, North Star, Rescue, and have been retained at different times in an advisory capacity in some of the others, smaller properties.
Q. How long had you charge of the McNamara operations?
A. Roughly speaking for about six years.
Q. How long?
A. For about six years as near as I can recollect.
Q. You are employed by the defendant the West End Company, at this time?

A. I am.
Q. In what capacity?
A. As general Superintendent of the West End property.
Q. How long have you been employed as the General Superintendant of the Defendant company?
A. Since last October.
Q. Prior to that time had you been employed by the West End Company?
A. I had.
Q. In what capacity?
A. In an advisory capacity, and to take care of examination work on the outside.
Q. Examination work what?
A. On the outside.
Q. What do you mean by that?
A. Outside of the camp.

216 Q. Were you employed by the defendant company to examine this mine, its mine and its works with a view to testifying on its behalf in this case, if the result of your examination and your judgment would enable you conscientiously to do so?
A. I was.
Q. When were you so first employed?
A. My employment continued with the West End Company. At the time that this suit was instituted, a different arrangement was made along the lines that you have just stated that I was to examine the property carefully, and if I could after a certain amount of work was done, conscientiously enter the case in behalf of the company I was to do so.
Q. So you have been employed in that capacity since about the time of the commencement of this action?
A. Yes, sir.
Q. And how diligently, how much of the time have you devoted to an examination with this end in view?
A. Well I have devoted considerable time. I do not know just how long. I expect in examining underground, perhaps I put in what would amount to several weeks' time.
Q. From your—Apart from your——
A. Regular duties since October first.
Q. Since that time I take it that you have been in the mine constantly?
A. Yes.
Q. Directing operation?
A. Directing operations, yes.
Q. Mining operations, regardless of any litigation?
A. Yes.
Q. And also observing the conditions in the mine with a view to the litigation?
A. Yes.
Q. I take it that your examination was made with a view of

ascertaining, if you could from the development, what you believed to be the course, direction or strike of the veins found in that mine, their dips and their tops, or apices.

A. Yes, that was necessarily a part of that work.

Q. Apart from the fraction vein that has been referred
217 to by the witnesses who have already testified, and also apart from what has been referred to as a branch of the south dipping vein near the west end of the West End Mining Company claim, how many veins did you find in the West End claim?
218 A. Three, so far as developed.

Q. Three, apart from the two that I have mentioned?

A. Yes.

Q. You are familiar of course with this model?

A. I am.

Q. Do you know what is meant by the witnesses when they refer to the south dipping vein?

A. I do.

Q. And the north dipping vein?

A. Yes.

Q. I wish you would indicate to the court what is the course or direction of the top or apex of the south dipping vein. You may step to the model if you desire to do so?

A. The general course?

Q. Just one moment.—You may proceed, you have the question in mind have you?

A. Yes. The general course of this line is easterly and westerly.

Q. Between the raise which has been referred to as 7-A and 302 I understand that the top or apex of neither the south dipping vein nor the north dipping vein has been developed, disclosed?

A. That is correct.

Q. And where it would be, where the top for instance of either of those veins in that section would be, could only be calculated by its position at either end where it is found, at either end of that section and from the general dip and the course of each of the veins.

A. Yes.

Q. Will you point out on the model Mr. Chandler in such detail as you can where you found the top of the south dipping vein; where its top is found in your judgment? Starting at the east end or west end whichever you prefer?

A. The top of the sou-h vein is found or is shown in a series of raises at juncture with the north vein. The change of color on these raises indicate these points.

Q. The uppermost edge of that is colored in red on this model, and as I understand represents in your judgment the top or apex of the south dipping vein?
219 A. It does.

Q. State whether or no in your judgment, the north dipping vein in its course upward extends above to the top of the south dippung vein, or whether there is but one vein there having an unbroken roll for its crest?

A. There are two veins, and in all of the raises above the junctures with the south vein, show the north vein to be continuous to the point shown, well defined, unbroken, that is as to hanging wall tracing.

Q. I will ask you to point out the raises that you refer to starting at the east end and going westerly; describe each raise and go into such detail as you think is necessary to give as clear a picture as can be given in words. What is found in each one of those raises?

A. On both veins?

Q. No, on the north dipping vein.

A. Well, taking the most easterly raise first, the 488, near the east end line of the West End claim, that raise follows the north vein to the top of the raise continuously.

Q. Now, with reference to the north vein, does—where is the foot of it, in the north vein?

A. The hanging wall of the north vein is exposed there near the foot of the raise.

Q. What is encountered in that raise?

A. The raise follows the north dipping vein with varying widths continuously to the top of the raise.

Q. Does it reach cap rock at the top?

A. Yes, it reaches cap rock at the top.

Q. In the roof?

A. In the roof; it is not cut off; the raise has not been run as far as the vein continues.

Q. There is still vein in the face?

A. There is.

Q. I wish you would describe the dimensions of the quartz as best you can, disclosed in that raise 488?

220 A. The width of the vein varies considerably; there is at least three to four feet of quartz at the lower end of it. And varying width to the top. The vein is considerably smaller in the top of the raise.

Q. About what width of quartz have you there?

A. Oh, as I remember it it is a foot or more; at least a foot.

Q. How does the quartz and vein material which is disclosed in that raise, and the other raises, compare in appearance with the quartz and vein material, further down in the north dipping vein?

A. There is to me no observable difference in the quartz or the vein in any of those upraises below the juncture, or the quartz further down in the same vein.

Q. Have you with you a sample taken from anywhere on the north dipping vein?

A. I have.

221 Q. Just produce it? Q. Is that marked in any way?

A. Marked "C" I.

Q. On the rock itself. Just point out where, in what portion of the north dipping vein that was taken?

A. That was taken in a cross cut marked I 537.

Q. At about where in the cross cut?

A. 30 feet from where this cross cut leaves the 569 raise.

Q. 30 feet northerly of that?

A. Yes; approximately 30 feet.

Q. I hand you a sample of rock which has been introduced in evidence and marked W-4, and which, according to the testimony of Mr. Wiley, was taken from one of these raises. I wish you would place that side by side with the sample of the rock which you took from the cross cut and state to the Court what, if any observable difference there is in those two samples of rock to indicate that they both were not taken from the same vein?

A. Practically there is no difference whatever. Both the varieties being white, and both showing absence of values, and evidences of country rock, that is pieces of country rock frozen on to each. The piece which Mr. Wiley took is a trifle whiter in appearance.

Q. Is what?

A. Is a trifle whiter in color. One is—as I stated, there is practically no difference.

Q. Now, take these raises up, from raise 488 as you travel westerly therefrom, and without further questions, take the raises up in the order which you encounter them as you go to the west and describe each with as much detail as you think is necessary?

222 A. Did you say on the south vein?

Q. No, on the north dipping vein?

A. On the north dipping vein.

Q. Yes, get through with that first.

A. Traveling westerly, the next raise is 461. This follows the hanging wall of the north dipping vein to its top, a distance of approximately 40 feet.

Q. And what is disclosed in it?

A. The vein against this hanging wall is continuously disclosed, with widths varying as in all of the other raises, there being about five feet of quartz near the foot of the raise, and at the top, I should say from memory, a foot and a half or two feet.

Q. That quartz that you find in that raise, as well as in raise 488, state whether or not it is in place?

A. It is in place.

Q. Where it was originally deposited, or whether it has been——

A. In my opinion it is in place.

Q. Go to the next one?

A. The next raise would be the raise 496.

Q. Is that in the north dipping vein?

A. That is in the north dipping vein. That is driven to a connection with the stope above, and is in the vein.

Q. In the north dipping vein?

A. Yes.

Q. Take 2 A passed by that. Two A raise.

A. Yes, I was working out on the level. 2 A raise is extended on the north dipping vein, which is in place, prefectly defined hanging wall throughout, and shows a width varying from five feet

223 maximum to a foot and a half or two feet further up.

Q. Of what?

A. Of north dipping vein.

Q. All quartz, or what?
A. Quartz.
Q. How far has that raise, 2 A, followed up above what is colored, represented in red as the top of the south dipping vein?
A. For approximately a hundred feet.
Q. And what have you at the—does that encounter the cap rock?
A. In one spot only; in the roof.
Q. And what have you in the face or top of that raise?
A. In my judgment, we still have trachyte overlying the vein.
Q. In the roof of it?
A. In the roof.
Q. And what about the floor of the raise at the top?
A. The vein still in the face, smaller than below.
Q. In the floor?
A. Yes.
Q. Now, go to 4 A raise.
A. 4 A raise, as in the case of 2 A raise, follows the north dipping vein continuously to the top of the raise and shows a width of quarts averaging probably 2 feet. In several places it is 4 or 5 feet in width.
Q. And what have you in the top of that?
A. The vein continuing.
Q. Quartz?
A. Yes.
Q. Go to 5 A.
A. Five A is a repetition of 4 A, extended about 70 feet.
224 The only difference being that the vein in 5 A is interrupted at about 70 feet by what appears to be a step fault.
Q. 70 feet above what?
A. The juncture of the two veins.
Q. The juncture of the two veins. And the 6 A?
A. 6 A has only been extended about 23 feet. Shows the north vein followed continuously against a well defined hanging wall; and good widths.
Q. 7 A?
A. 7 A—I guess better start with 494, which is the lower extension really of 7 A. That follows the north dipping vein, does not expose the hanging wall continuously. Has gone pretty well into the foot for certain distances, the hanging wall is exposed by these two raises indicated. The raise then follows the vein up to the juncture with the south vein, and continues beyond that point, as indicated by the yellow coloring, 7 A being, as far as the vein is concerned, weaker than in the other raises.
Q. No quartz in it as you follow it?
A. Yes.
Q. All the way?
A. Not all the way. That is,—not quartz, what I would consider a continuous vein tracing all the way.
Q. How far was that raise driven above the juncture of the two veins?
A. To approximately 40 feet.
Q. And what have you in the top or face?

A. We have a much altered condition of wall rock.
Q. Now, take the next one as you go westerly.
A. The next raise is raise 302.
Q. Point to that please.
A. (Witness does so.) And a continuation of it, 366, although 366 is an older raise.
Q. What is that portion of the 366 raise which is shown in yellow upon this model?
225 A. What is it?
Q. Yes.
A. It is a raise following the north dipping vein.
Q. Above the top of the south dipping vein?
A. Above the top of the south dipping vein until a point is reached about ten feet below the 200 level south cross cut, at which point this vein terminates against the capping.
Q. What have you in that portion of the 366 raise, which you say is in that north dipping vein, in the way of vein material, quartz, or what not?
A. We have a large width of quartz, a well defined hanging wall, which is following continuously to the point stated, against the cap rock, from the connection with the 302 raise.
Q. The next one to the west is the A-raise if I understand you?
A. Well, the A-raise is the next raise of importance, I guess.
Q. Well, describe that. How far is that driven above the juncture of what you call the two veins?
A. About forty-five feet. That raise follows the continuation of the hanging wall carried in this McNamara stope below, and that wall is continuously traceable to the top of the raise,—follows the vein, the raise does, with varying amount of quartz, at a point about five feet back of the face, where there is about two and a half or three feet of vein in place on the hanging wall, low grade ore; showing that different points vary. Down near the foot here it is weaker, at one point.
Q. Than at the top?
A. Than at the point just mentioned yes sir.
Q. A vein back from the top?
A. Yes.
Q. Now is there anything further Mr. Chandler that you
226 have to say, that you think would be necessary to say with respect to these raises on the north dipping vein?
A. Above the juncture with the south dipping vein?
Q. Yes.
A. No, I think not.
Q. Now, take some of the raises here near the easterly end of the claim on the south dipping vein, and describe those, and the juncture as well.
A. Within the limits of the West End claim, or to the east?
Q. Within the limits of the West End claim.
A. The first raise is No. 569, shown there, follows on the south

dipping vein from the top of the stope continuously to the juncture with the north dipping vein.

Q. And at the juncture of the two veins, in that raise what do you observe as to structure of vein?

A. Following up the raise, as I said in the vein, the hanging wall is exposed up to a north dipping wall, against which the south dipping vein terminates.

Q. What is the dip of the south dipping vein, as you follow it up that raise.

A. Oh, looking at the raise, not remembering the dip, I think it is twenty-five or thirty degrees to the south.

Q. And at the top of that raise I understand that you encounter a north dipping vein?

A. We do.

Q. And above that what is the dip of the north dipping vein?

A. The north dipping vein is at about forty five degrees.

Q. Well, go to the next raise?

A. The next raise is 571. and a description of 569 exactly fits 571.

Q. Go on to the next. If there are any features in any one of them, as you come to it call attention to it.

227 A. Raise 573, follows the vein from the top of the stope, exposing a hanging wall most of that distance, and stops against the south dipping wall—north dipping wall as in the other cases mentioned.

Q. Go ahead?

A. Well, those are the important raises that have been previously discussed by the other witnesses.

Q. Taking the south dipping vein how do you classify it? what character of vein is it? Is it a contact vein or fissure vein or bedded vein, or vein of impregnation?

A. I call it a fissure vein. The width of the vein having been increased by a replacement, principally of the foot wall rock by silica; throughout the major portion of the workings, and in other places coinciding with the contact between two rocks.

Q. What is the course generally of that fissure?

A. Easterly and westerly. The strike in the eastern portion of the mine is more nearly east and west, and in the southwest portion the strike is more to the south.

Q. I will ask you if the strike or direction of the south dipping vein is conformable to the strike or direction of the fissure?

A. It is, lying in the fissure.

Q. And how does the dip of that fissure on its downward course, correspond with the dip or downward course of the south dipping vein?

A. It is the same.

Q. The replacement that you have referred to in the foot wall of the south dipping vein, does that predominate, that feature?

A. Almost entirely in the foot wall.

Q. And extends out for varying distances, I take it?

A. It does.

Q. From a minimum to a maximum of what, so far as you
228 have observed?

A. Well, in places in this east territory for at least twenty to twenty five feet into the foot wall.

Q. That is a maximum?

A. For at least that distance.

Q. And the minimum of what in places?

A. Oh, I think never less than five or six feet.

Q. To what extent has the process of replacement or impregnation extended into the hanging wall country of the south dipping vein?

A. Very little, it is negligible I don't off hand recall a place where it extends above the hanging wall of the vein, with the exception—I will qualify that; no, I won't, on second thought.

Q. Coming now to the north dipping vein, how do you classify that vein?

A. That is also a fissure vein.

Q. Is there a fissure there in the north dipping vein as distinguished——

A. It occupies a fissure.

Q. The vein itself—And how does the direction or course of the north dipping vein correspond with the course and direction of this fissure which you refer to?

A. Coincides with it.

Q. What is the dip or downward course of the fissure as compared with the dip or downward course of the north dipping vein?

A. The same.

Q. Conformable? And you have foot wall country of the north dipping vein changed,—impregnated, as in the case of the south dipping vein?

A. We do in places.

Q. And what about the hanging wall country of the north dipping vein; has that been replaced?

229 A. There are a few small vertical fractures in the westerly part of the mine, in which the several minerals has been deposited; cracks merely, and an inch or two in width, practically no silica.

Q. When you come to the plane of juncture of two veins, and for some distance beneath that juncture, I will ask you to what extent the intervening country rock has been replaced mineralized, and sometimes converted into ore?

A. It has been very extensively silicified, so that the entire territory and to the point of juncture, especially under these A-raises, shows a continuous body of quartz in which you may pass from one vein to the other.

Q. The intervening country there being——

A. Quartz.

Q. And vein matter?

A. Yes.

230 Q. I wish, Mr. Chandler, you would describe, as you may think necessary so that the Court may understand it, the re-

lation of that so called Fraction vein to the south dipping vein? You can use the model to illustrate.

A. It has been pointed out a number of times, by the position of the workings in it. Shown here in the West End drift 422 W up to a point here where it is dislocated by a fault to the position here (indicating).

Q. If that is numbered, give it?

A. To 422 N.

Q. How far to the west in this level have you been able—has it been developed?

A. To the point, as shown here, going westerly.

Q. Where the——

A. Where the cap rock is in evidence.

Q. What level is that?

A. That is the 400 level. Drift 422 W.

Q. Go ahead.

A. And it has been followed south easterly in drift 422 north and into 422 south to a point approximately 120 feet from the south side line, where this is crossed by 422.

Q. South side line of the West End claim?

A. Exactly. At which point connection has been made by an upraise from the top of a Jim Butler stope.

Q. Is that a stope in the Fraction vein?

A. It is. And there is a continuous connection in the Fraction vein to 422 S. I say continuous connection,—there is a small step fault between in which——

Q. Between what points?

A. Between the top of stopes and the 422 S. The two seg-
231 ments of the vein having been connected in this fault in drag ore.

Q. Go ahead.

A. There are other minor stopes in this Fraction vein in this immediate territory. It is not necessary, I guess, to go out in this——

Q. Go down to the point where the two, the Fraction and the South dipping vein unite, if they do unite?

A. Well, going down the winze—the winze in the main West End south vein, extended on down to here (indicating) an upraise was made cutting the Fraction vein, which was followed to a connection with the 7th Butler level in the same vein. This stope 718 in the Fraction vein above the 7th level is practically connected with the main West End vein by a raise on the vein, now being extended to close this gap.

Q. Now, in the Jim Butler workings, is there a connection between the Fraction vein and the south dipping vein?

A. There is, just east of the West End winze, mentioned, and shown by this working.

Q. What working, so the record will show?

A. From W 700 to West Drift 702, a connection has geen made.

Q. The two unite there, the Fraction vein and the south dipping vein?

A. Yes. This is in Fraction vein down to its juncture with W 700.

Q. I call your attention to what has been referred to in cross-examination of one of the witness- as a stope there in the shape of a roll or an anticlinal fold.

A. Yes.

Q. What have you to say about that, if anything?

232 A. Apparently it shows a fold, or what you term a roll. It is a very small proposition, however, and is probably accounted for by the fact that the stope is faulted and the appearance is given largely on account of stoping in both segments, as well as in the drag between.

Q. Is that stope on a contact between different rocks, or does it lie all in homogeneous rock—trachyte?

A. Both foot wall and hanging wall is trachyte?

Q. This south dipping vein and the north dipping vein, either or both of them have any place which might be termed a contact vein?

A. Only in the sense that the fissure coincides, as explained previously, with a contact for a certain distance, throughout both properties.

Q. I wish you would pull down Exhibit G. I call your attention, Mr. Chandler, to Section A of Exhibit G; of course, what is colored in red there, the longest streak of red is intended to show the south dipping vein?

A. Yes.

Q. And the upper, the Fraction vein; and the yellow the north dipping vein.

A. Yes.

Q. What is the foot wall country rock of the north dipping vein and the south dipping vein at that plane of Section—you know where that was taken?

A. Yes. I call it trachyte.

Q. What is the north, or hanging wall country rock of the two veins?

A. The same rock.

Q. Here I notice on Section A a small space colored brown. What rock is that?

A. That is intended to represent a small distance here
233 where the West End rhyolite is shown, or what be believe to be West End rhyolite.

Q. Is that in contact with the south dipping vein, or slightly below it?

A. It is immediately in the foot wall.

Q. Elsewhere, is it true that the footwall country and hanging wall country are trachyte as cut by that vein section?

A. In this section?

Q. Yes?

A. Yes.

Q. Going to Section B of the same exhibit. The veins are there again disclosed, the Fraction vein, south dipping vein, north dipping vein. I will ask you what the footwall country and hanging wall country is where that plane of the section was taken?

A. Trachyte, except at the point shown at the top of the Fraction

vein against the cap rock. The enclosing rocks however, are trachyte.

Q. Go to section C, where you have the same veins depicted. What is the footwall country of the north dipping and south dipping vein where that plane of section was passed through or taken?

A. As explained a few minutes ago, the vein, in certain limited area, coincides with the contact between two rocks which we call trachyte and West End rhyolite. This section illustrates that, the footwall country being what we term West End rhyolite and the hanging wall rock trachyte.

Q. Is it your judgment that the north dipping and south dipping fissures, which you have referred to, formerly in your testi-
234 mony, follow the line of contact between the line of rhyolite and trachyte?

A. That is my opinion.

Q. Going to section D on this same exhibit, what is the foot and hanging wall country which encloses both the north dipping and the south dipping veins?

A. That is a section to the west of this section, and shows again the enclosing rock to be trachyte.

Q. I will ask you to point out to the Court, or indicate the place, if there be any such, where you find at the juncture of the north dipping and the south dipping vein a gradual change in the dip of either one of them, as they approach and meet, or whether the fact is, where you have been able to observe the point or the line of plane of juncture, there is an abrupt change from a south dip to a north dip?

A. The change from a south dip to a north dip is a sudden one The angle between the south dipping hanging wall and the north dipping hanging wall being in places as small as 20 or 25 degrees. In other words, it is a sharp, sudden change in dip.

Q. Between the two veins. Does the hanging wall proper at the uppermost limit of the south dipping vein come in contact with the hanging wall of the north dipping vein?

A. Never in actual contact with the hanging wall. They are very close in several places.

235 Q. You have never seen the hanging walls of the two veins in actual contact?

A. Never seen the hanging walls of the two veins in actual contact?

Q. Yes, the hanging wall of the south dipping vein in contact with the hanging wall of the north dipping vein?

A. I can be certain throughout all the territory, with the exception of A raise, and the stope from the McNamara to the West End, and the condition is indeterminate to me at that point. I can not say that the hanging wall of the south dipping vein does not actually reach the hanging wall of the north dipping vein.

Q. You mean that place that is undeveloped. That has been referred to in 703 raise?

A. No I mean in raise—A; the hanging wall of the south dipping vein is not visible just below the A-raise, because there is still vein or quartz in the top of this stope.

Q. The top of the red stope?

A. Unless that wall were continuously stripped up through here I would not want to make a statement as to that.

Q. Well, apart from that?

A. Well, apart from that throughout this eastern country in all these raises, over to 302, the hanging wall of the south vein does not reach the hanging wall of the north vein. In one of the A-raises I have noticed the hanging wall of the south vein within two feet of the hanging wall of the north vein in one place,—4-A raise.

Q. Were you formerly Mr. Chandler, of the opinion,—a different opinion respecting this vein than you now entertain?

A. Which vein?

Q. Were you formerly some years ago, did you have a different opinion from that which you now entertain respecting this
236 vein in the West End ground, this main vein or veins?

A. You are speaking now of the north vein?

Q. The two veins.

A. Yes, sir.

Q. You remember a suit that was at one time pending between the West End Mining Company and the McNamara company?

A. I do.

Q. And that case did not come to trial as I understand it?

A. No.

Q. And were you connected or employed by the McNamara in connection with that litigation?

A. I was.

Q. For how long a time Qending that litigation?

A. Throughout its whole extent. I don't remember how long it was pending I guess a year or more.

Q. I wish you would describe to the court so far as your memory and reference to the maps will aid your memory, and enable you to do so, the extent of the work, the development work in the West End ground on this vein, on the 200 level of the West End; you may refer to the map if you wish.

Mr. Lindley: As to what his former opinion was?

Mr. Dickson: The extent of the development work at thw time that he had the former opinion.

Mr. Lindley: Is This intended as an apology or an explanation?

Mr. Dickson: As an explanation.

Mr. Lindley: Well if you don't bring that out I will do so.

Mr. Dickson: I supposed so. It won't take any more time now than then.

Q. Referring to the map——

A. I can point it out here. This is largely a matter of
237 memory.

Mr. Lindley: I may be able to help out your memory Mr. Chandler.

The Witness: I will be glad if you can judge.

Mr. Peck: I suggest that Judge Lindley take the stand and give his testimony now.

Mr. Dickson: Go ahead, how far has the workings developed, what you now speak of as the north dipping vein.

A. On the 200 level of the McNamara this west drift had been run.

Q. In what west drift?

A. This west drift.

Q. That is cap rock?

A. Well, it had been run——

Q. Well go ahead in your own way.

A. Out to the vein here.

Q. Well the record will not inform any of us as to what "here" is. You will have to designate it.

A. There is no number on the stope so I cannot refer to that.

Mr. Lindley: I would like very much Judge Dickson to have that drift numbered.

A. It is the 200 west drift of the McNamara, Judge.

Mr. Lindley: I am familiar with the drift but the testimony won't show it unless it is numbered. Just number that Chandler-1 to identify it.

Mr. Dickson:

Q. And you had better indicate at the same time points that you wish to refer to in answer to this question.

A. Well, as nearly as I can recollect the two hundred west drift of the McNamara had been constructed up to that time to a point marked in pencil "C-X."

Q. On the model?

A. On the model. Understand this is from memory, but I
238 think it will be approximately correct. Stoping had been under way in this stope above the 200 west drift, the only stope shown here on the model.

Q. Is this—In which the raise—A is now found?

A. At the top of which raise—A is now located, and had joined the stope of the West End company, directly south.

Q. And shown on this model in red?

A. In red.

Mr. Lindley: Any upraises, if you will pardon the suggestion?

A. This upraise (indicating).

Q. Better number that too then.

Mr. Dickson:

Q. What did you number that here.

A. I just numbered that C-X. What do you want it numbered?

Q. Well, (C-1) will do.

A. Suppose I number it "R-3"; that is what we called at that time apex raise No. 3.

Q. Anything that will designate it.

A. Raise "R-3" had been run to its present face.

Q. Go ahead.

A. The upraise,—that is not numbered either directly below and slightly to the north of upraise No. 150 had been put up.

Q. From what level?
A. From the 200 level south cross cut.
Q. Go ahead——
A. There are several raises here probably too, but to the best of my recollection the workings had not extended at the time as far west.
Q. You mean this far west?
A. As far as these other raises.
239 Q. According to your best recollection about where was the most westerly development on the vein.
A. I have marked it here and referred to it as "C-X." I don't recall any raise above the 200 that had been put up at that time, from the 200 McNamara.
Q. How far easterly on the 200 level, had the vein been developed at that time?
A. Easterly on the 200 level of the McNamara?
Q. Yes. I will speak now of what we call the north vein. How far east had that been developed?
A. The most easterly point that the vein had been exposed by any workings on the 200 level in the McNamara was at the point where the south cross cut to raise 150 was started.
Q. How far westerly, according to your best recollection, had the vein been disclosed at that time, the south dipping vein?
A. Almost as far as the 200 level west on the West End company, as it now shows. West to what point I cannot say.
Q. But nearly as far as shown now?
A. Yes, within anyway one hundred feet.
Q. How far easterly had the south dipping vein at that time been disclosed, on that level the 200 level of the west end?
A. To the best of my recollection the most easterly point that the south dipping vein had been found on the 200 level of the West End, was at the foot of upraise 202, but of that I am not certain.
240 Q. You are not certain that it extended that far, are you?
A. I mean I don't know whether this 202 drift had been extended as far westerly as that. I believe it had. That is a long time ago.

Mr. Lindley:

(Q.) Where is that, Mr. Chandler?
A. Right here, Judge Lindley (indicating). That is a long time ago and I can't be certain of that.

Mr. Dickson:

(Q.) Now, I do not know, it seems to me we might go into the 300 level. It would be preferable to use the map instead of the model.
A. They are all numbered on the south side.
Q. State, according to your best recollection, how far easterly and westerly—that is, how far to the east and to the west had the north dipping vein at that time of the MacNamara West End litigation pending been developed on the 300 level?

A. How far east or west?
Q. Yes?
A. Which?
Q. Both; the westerly and easterly termini of the works on that level at that time, 300 level?
A. I don't believe West End drift 302 W had been run at that time, and I believe the farthest point to the west to which the north vein had been discovered was near the MacNamara line, directly north of the West End shaft.
Q. And about what point would that be on the model?
A. In raise, or in cross cut—what is that number? 110, is it?
Q. Looks to me like 116. I don't want any mistake about it. What is the number?
241 A. I do not mean raise. That is not a raise. In cross cut 311.
Q. And how far had the vein been disclosed at that time, the north dipping vein easterly on the 300 level, the farthest point east?
A. I think in the 303 East drift.
Q. At about what point on the model, if it is shown on the model?
A. At the raise——
Q. Westerly, I am speaking of?
A. I gave you westerly first.

The Court:

(Q.) You said easterly.
A. Well, that will have to read westerly.

Mr. Dickson:

(Q.) So that we will get it right, if I understand, then, the most westerly workings on the vein or in the vein on the 300 level at that time was in that cross cut 311?
A. Cross cut 311. And the most easterly point, to the best of my recollection is or was in 316 cross cut from 303 east drift, at a point at the foot of raise 362.
Q. Then, about to what extent, according to your recollection, easterly and westerly, had the vein been disclosed by any workings at that time?
A. I did not get that.

(The reporter read the question.)
The Court: Referring to the 300 level?

Mr. Dickson:

(Q.) The 300 level, yes.
A. Oh, approximately 150 feet.
Q. Now, going to the 400 level. Oh, no, before I go to that: to what extent at that time had—strike that out. At that time,
242 what were the most easterly workings on the south dipping vein, according to your best recollection on the 300 level?
A. On what level.
Q. The 300 level?

A. I believed that there was only one vein at that time, so that the answer in regard to the——

Q. You believed there was only one vein at that time?

A. My answer in regard to the extent developed on the north vein would apply in answering this question.

Q. Would be true also to the south dipping vein. What we now call the south dipping vein?

A. Yes.

Q. Then, we will go to the 400 level, and give us your best recollection as to where development work on the vein on the 400 level—vein or veins—terminated in a westerly direction?

A. Once more, please?

(The reporter read the question.)

A. In what property?

Q. In the West End claim. The most westerly development on this vein or these veins on the 400 level at that time, either in the West End workings, or the MacNamara workings?

A. I believe that the most westerly workings from the 400 were at that time in 403 stope.

Mr. Lindley:

(Q.) You have reference now, Mr. Chandler, to the south dipping vein?

Mr. Dickson: He is pointing now.

Mr. Lindley: I understood your question to apply to either the MacNamara or West End.

Mr. Dickson: Yes, he is pointing now first to the south
243 dipping vein. Then I will have him go to the north dipping vein.

Mr. Lindley: The most westerly development?

A. Most westerly development on the 400 level on the West End property. I believe that the operations farthest to the east at that time——

Mr. Dickson:

(Q.) To the west.

A. To the west were in 403 stope, just west of the present working shaft.

Mr. Lindley:

(Q.) The most westerly workings of the West End at the time of the litigation between the West End and the MacNamara was where?

A. On the 400 level. I believe was in stope 403.

Q. Oh, on the 400 level?

A. Yes.

Mr. Lindley: I beg your pardon.

Mr. Dickson:

(Q.) And where at that time on the 400 level was the most easterly workings that had been driven on the vein disclosing it?

A. Most easterly workings?
Q. Yes?
A. Now, this is going back into ancient history, but—at a point at the foot of upraise 485 about 40 feet south east of the old McQuillan shaft.
Q. Now, at that time on the 400 leve-, where were the most westerly workings of the MacNamara?
A. 400 level?
Q. 400 level.
A. They have no 400. The next level below the 3 is the 375.
Q. Well, go to the 375, then. Had that been driven at the time of that old litigation?
A. There are no workings in the vein on the 375 level—were no workings in the vein on the 375 level at that time.
244 Q. What was the deepest level in the mine—the workings in the deepest level, workings of either the West End Company or the MacNamara at that time?
A. What were the deepest workings?
Q. Deepest level, yes.
A. The deepest level of the MacNamara was the 500 foot level; and the deepest level of the West End, I believe, was the 400.
Q. Well, to what extent easterly and westerly had the vein which we now call the north dipping vein been developed on the 500 foot level?
A. Of the MacNamara?
Q. Yes.
A. Not at all.
Q. You say that at that time, the time of that litigation, you believe that there was but one vein?
A. I did.
Q. You have pointed out the place on the 300 level, I believe it was, where the works in an easterly direction at that time—the workings on the vein on the 300 level terminated easterly?
A. In what property?
Q. Well, we will say in the West End Company's workings?
A. 300 level easterly; yes, I did.
Q. You did not intend that to represent the most easterly workings on that level in the MacNamara?
A. No, that was in the West End ground?
Q. Where were the most easterly workings in the 300 level in the MacNamara ground at that time?
A. In the 300——
Q. On the 300 level, yes.
A. Yes, in the 300 east drift.
Q. How is it designated on the model, if at all?
245 A. Well, it is the east face of the 300 east drift at a point——
Q. Well, that 300 east drift ought to be marked.
A. It is marked 300 here. It runs west of the shaft, and it is east

of the shaft, and the point I refer to is a point in the face of the east drift.

Q. What were the most westerly workings in the MacNamara on the 300 level at that time?

A. Not shown on this model, because, they extend north.

Q. Get the map. Will they be shown on the map?

A. I think so. It would be pretty hard to refer to this point. I know where it is, but there are no numbers for reference here; no stations.

Q. Well you are referring to the map of the fourth level, labeled Exhibit C?

A. The fourth level of the West End,—no the 300 level of the West End.

Q. Well, distinguish on that exhibit by drawing a line and putting your name over it, or the word, Chandler, over it which will show the most westerly workings of the McNamara on the 300 level at that time?

A. You mean now at the time that this suit was instituted?

Q. At the time that suit was pending, from the beginning or until the time that it was settled.

A. Well, work was *was* going on during that entire period.

Q. Well where was it at the time that that suit was commenced?

A. That is what I have been referring to, the time the suit was instituted. I have marked the point in the main McNamara 300 level. I have marked it with the mark 'C-X' with my name
246 over it and the mark is in the 300 main drift of the McNamara.

Q. You have made that marking on Exhibit C?

A. I have. That is as near as I can recollect.

Q. You say that you have been answering all of the time, as to the extent to which the workings had extended easterly or westerly at the time that suit was instituted?

A. As near as I can recollect.

Q. What I had in mind, was the most easterly and westerly workings of the vein, while that suit was pending, I will not take the time to go over it again. Mr. Lindley can bring that out on cross examination if he desires.

I will ask you if at the time that suit was terminated, was settled, you were still of the opinion, in the light of the then development, there was then but one vein?

A. I was.

Q. At that time, and I mean now not when the suit was commenced, but when it was finally settled, had there been any raises put up above the crest, of what you took to be the only vein? If so how many and where?

A. Upraise No. 488 had been extended a short distance above the 411 East drift.

Q. Any others?

A. Upraise 4-A had been extended above the juncture of these two veins.

Mr. Lindley: What time is he speaking of?
Mr. Dickson: The time that the suit was settled.

A. Upraise 4-A had been extended practically 25 ft. above the juncture of the two veins.
Q. Any others?
A. Your question as I recall, referred to raises above the juncture of the two veins.
Q. Above the juncture of the two veins?
A. So as it was not demonstrated at that time that 488 was above the juncture of the two veins, that raise would not ap-
247 ply.

Mr. Lindley:

Q. Well that raise was run?
A. Yes, it was run.

Mr. Lindley: All we want is the facts.

Mr. Dickson:

Q. Had the fact of the junction between the two veins at the point where the raise 488 was run up been uncovered?
A. The juncture of the two veins?
Q. Yes?
A. No it had not.
Q. How about the point at 4-A had the juncture there been developed at that time?

Mr. Lindley:

Q. It is in that group of raises?
A. 4-A is here, yes.

(Last preceeding question by Mr. Dickson read.)

A. Yes.
Q. Without showing what it was, I suppose that there were other general experts engaged with you in the examination on behalf of the McNamara company at that time; you were not the only one?

Mr. Lindley: He was not the only one, who was not the only one?
Mr. Dickson: This witness.

Mr. Lindley: Mr. Chandler was not engaged as *as* expert at that time, he was manager of the company.
Mr. Dickson: Well, I did not know that, I thought that he was an expert from what I have seen of the record.
A. No, not at that time.
Mr. Lindley: He developed into that later.
The Witness: Later.

Mr. Dickson:

Q. Were there experts employed at that time by the Mc-
248 Namara company?
A. There were.

Q. Was this raise 4-A—don't say what was said,—was this 4-A a matter under discussion between you and any of the experts?

Mr. Lindley: I object to that as being entirely immaterial, if the experts are here in the court room.

Mr. Dickson: I just asked as a matter of discussion. I did not ask what was said.

Mr. Lindley: Put me on the stand — swear to it.

Mr. Dickson: Well do you object to it. I did not ask what was said.

Mr. Lindley: Well, if the court will permit me just a moment to make a parenthetical remark at this stage of the game; this gentlemen has been put upon the stand to prove the condition of two veins, and to apologize or explain why he thought at one time there was only one vein. Now that is all the advantage I think counsel is entitled to. How he might have been mislead by experts is a matter that is entirely immaterial, and if he had that conviction at that time, he was the superintendent in charge of the McNamara company. Counsel is entitled to that but what his discussions were with his associates——

Mr. Dickson: I did not call for the discussion, and I will withdraw the question if there is any objection to it. I simply desired to show that it was discussed, significance of that raise without saying what was said about it.

Q. You may state what your opinion was while that suit was pending, from the time it was brought until it was compromised as to whether or no an anticlinal fold or roll could or could not be
249 regarded as the top of the vein.

A. I was given to understand that the crest, of a roll or fold was not a legal apex.

Q. It was not a legal top of the vein?

A. The legal apex.

Q. Now do not answer this question; I do not know whether counsel will desire to object to it or not. You say that you were given to so understand. I will ask you if you were so informed by counsel, leading counsel for the McNamara company.

Mr. Lindley: I have no objection. Certainly he knows as everybody knows that that has always been my position and I have not changed it either.

A. Yes, I was.

Mr. Dickson:

Q. Now I wish you would state Mr. Chandler—take your time—enough to cover all that need be said or that you can say on the subject—all of the facts observable by you, and which has been observed by you since that litigation between the McNamara and West End Companies has induced you to change your opinion which you then entertained, and to reach the conclusion which you have here testified to, namely, that we have two veins, namely the north dipping vein and the south dipping vein.

Mr. Lindley: I object to that as being purely self serving. He stated the facts and that is all that this court desires to know, and the reasons are material only in the mind of the witness. He has stated his position, stating that he has changed his mind, he has gone over the structural conditions here, and explained why
250 there are two veins, and in my mind that is merely an opportunity for the witness to bolster up his own testimony.

Mr. Dickson: I do not think that you mean to use that phrase "bolster up his own testimony" in an offensive way.

Mr. Lindley: No I never do. Mr. Chandler and I have been friends for years, but I have my views the same as Mr. Chandler has.

Mr. Dickson: Yes. Most gentlemen and most experts I suppose would not hesitate or fear to state that they had been induced, or he had been induced, to change his opinion respecting any vein, and that change of opinion was induced by the light shed upon the situation by subsequent development work.

Mr. Lindley: Isn't that obvious from his own statement?

Mr. Dickson: I think that I am entitled to it. I will take a ruling.

Mr. Lindley: Well I will withdraw the objection.

251 A. That does not include an explanation of the basis of my belief, that at that time there was but one vein, as I understand the question?

Q. Yes, it does.

A. As stated, I was superintendent of the MacNamara mine at that time, among other places, where we were working, we were engaged in stopeing in this stope from which A raise is made.

Mr. Lindley:

(Q.) A raise had not been made at that time?

A. It had not. We followed the vein upward on its dip in this stope to a point which at that time appeared to be the crest of the fold or roll, and from which point the stope, the commercial ore took a dip to the south into the property of the West End Mining Company.

Mr. Dickson:

(Q.) The crest, or what you then took to be the roll at that place is over the north side line of the West End, within the MacNamara ground?

A. Yes, sir.

Q. Go ahead.

A. So, as a matter of fact, we mined over the change in dip to the line of the West End Company; at which point this vein continued to dip southerly and into their ground.

Q. Go ahead.

A. On that development alone, I came to the conclusion that it was one vein, having formed a fold or an anticlinal roll.

Q. Where else at that time—withdraw that. I do not want to interrupt the witness. Go ahead, Mr. Chandler.

A. The only other place, as I stated before, that we had any development around the top of what we now term the north
252 dipping vein, was raise 4 A, where we found that there was what we called a break or a fault. And that the north dipping vein, with a well defined hanging wall, extended upward and above what we then considered the south leg.

Q. South leg of what?

A. This fold or anticline.

Mr. Lindley:

(Q.) Single vein?

A. On the single vein theory. I personally did not pay any attention to that condition here because our territory over here opposite is a very small wedge, and we had—the territory is very small, this wedge here, and we did not believe it was very valuable, our developments, ore developments were considerably further to the West. So, as I say, I did not give that much consideration.

Mr. Dickson:

(Q.) At that time?

A. At that time. We wanted to protect ourselves on account of the ore extracted and in the process of being stoped, and wanted to continue our developments in this territory where we had found ore in a number of places.

Q. Go ahead, if you have anything else you wish to add.

A. I don't know just how much in detail I ought to go into this change of attitude on my part, but if it is permissible, I will say I had been engaged by the West End Company for some months previous to the institution of this present suit in an advisory capacity in respect to the West End Mine, and also—I believe I stated this before—was to be called upon to make any outside examination. When this suit was brought——

Q. You mean the present suit?

253 A. Yes. I was called into conference, and when asked regarding the situation from my previous experience in the——

Q. Well, now, you need not state what you said outside of the court room to anybody. That would be hearsay.

A. I see. Well, then, the recent development——

Mr. Lindley: What the witness said?

Mr. Dickson: What he said to somebody on our side of the case.

Mr. Lindley: You claim the communication was a privileged one?

Mr. Dickson: No, I thought you would object.

Mr. Lindley: No, I do not.

Mr. Dickson:

(Q.) Just state, then, what you were about to say.

A. I was called in conference and asked regarding the previous litigation and my views. I said they had not changed any. If there is any other condition than the one I believed to be the case, that it would certainly take considerable work to ascertain the facts. And

I suggested certain work to develope the facts through this eastern portion of the territory.

Q. And what development do you refer to now? What development work?

A. Theses raises, 569, 571, 573, the A raises.

Q. All of the raises that have been put up since the commencement of this suit?

A. Yes.

Q. Including the A raise?

A. Including the A raise. And as a result of those developments, I have been forced to change my mind.

254 Q. At that time, was there anything at any place in the vein or veins that you believed to be what you call the toe of the roll? And if so, I will ask you to point that out and explain what you mean by it?

A. There was. What we termed then the two legs of what we believed to be a fold were converging in strike to the east, and if there actually was an anticline, anticline or a fold, of necessity at some points in this eastern territory we would be able, and have to, as a matter of fact, to establish it, come around on a curved line.

Q. At the easterly end?

A. Yes, come around on a curved line on the 400 level from the north east dip, on what we now call the north vein to the southerly dip on what we now term to be the south vein.

Q. Well, did you come to any such toe or curve at that time, or was there any such disclosed? Or what you took to be such?

A. There were indications of a toe.

Q. Where?

A. In the neighborhood of the old McQuillan shaft, or just east of there.

Q. Well, about what——

A. Well, around No. 461, number 485.

Q. In that neighborhood?

A. Yes. There were indications of a toe, although there had been no developments on either the south hanging wall or the north hanging wall, so that until developments were instituted and those walls followed——

Q. Further east?

A. Further east, there could be no certainty. Those developments have been made and show that instead of there being
255 a coming around on the toe of a roll, that each vein, as we now term them, continued on the average strike line, as shown for some hundreds of feet, and did not coincide so as to form one common hanging wall.

Q. Or curve?

A. Or curve.

Q. Continued on to the east. Where at that time—I mean now up to the final determination of the old MacNamara suit, at how many places had the crest, of what you then took to be a roll or the juncture or what you now claim to be the juncture of the two veins been disclosed by any workings?

A. Only in 4 A raise, and the stope from which A raise in the MacNamara has been put up.

Mr. Dickson: I think that is all the direct.

The Witness: Judge Averill, is it permissible to speak to our attorney at this time?

The Court: Any objection to Mr. Chandler speaking to his counsel?

Mr. Lindley: Not the slightest, no sir.

The Witness: I would like to speak to Judge Dickson privately a moment.

(Witness does so.)

Mr. Dickson:

(Q.) Then, do I correctly understand, Mr. Chandler, that at the time that litigation was pending and up to the time it was settled, the only places, being two, were the crest of what you then believed to be a roll in one vein—that at both those places, the appearance was of a gradual, unbroken fold from a north dip to a south dip?

A. No. The only place—there were two places, yes. The only place that that development seemed to certainly point to
256 that condition——

Q. That is, a roll?

A. Yes. Was in the stope in this region of the A raise. I said that the indications east of the old McQuillan shaft in the region or neighborhood of 461, 485 etc. pointed to there being the toe of a roll.

Q. Yes, the end of it?

A. Yes. But that this was not determined, and could not be, as I stated before, until drifts h-d been run easterly on both the hanging walls of what we now term to be the north and the south veins.

Q. Yes; I do not think you quite understood my question. The question was this: I understand that at that time, while that suit was pending, there were only two places where the top or crest of what you then regarded as a roll in the vein had been disclosed, namely, where the A raise now is, and at the bottom of the 4 A raise?

A. Yes, except that at 4 A raise there was no indication of a roll.

Q. There was no indication of a roll there?

A. As I stated before, we considered that there was a break or a fault.

Mr. Dickson: The witness called me aside to say that he wished to make a correction in one of his statements. You may make the correction now.

The Witness: You asked me about the sudden change from north to south dip. I said it was sudden, and I mentioned an angle, and that was merely a guess, and should not go in as testimony.

Q. Well, what angle did you give, do you remember?
257 A. I gave 45, didn't I?

Q. 25, I think.
A. I would like that sentence stricken out of my testimony.
Q. What would be the angle? What do you want to substitute?
A. It is a greater angle than that.
Q. What is it?
A. I have not measured it.

Mr. Dickson: Well, do that at noon. There are one or two questions more in direct.

The Court: The case is continued until 2:0- o'clock this afternoon.

258 Afternoon Session, 2 o'clock p. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

JOHN W. CHANDLER, direct examination, resumed.

Mr. Dickson:

(Q.) Mr. Chandler, have you ascertained the included angle between the hanging wall of the north dipping vein and the hanging wall of the south dipping vein?
A. Yes, the average.
Q. What is it?
A. In the neighborhood of 125 degrees.
Q. Instead of 25?
A. Yes; just add 100.
Q. These veins, I mean the south dipping vein as well as the north dipping vein, on their course westerly terminate against what; what, if anything, interrupts the onward course of the veins as you go to the west?
A. There is nothing so far that interrupts the course of the north vein to the west.
Q. What about the south vein?
A. The westerly workings of the south vein and against Mount Brougher dacite.
Q. And eruptive rock, is it?
A. Yes sir.
Q. An extensive intrusion?
A. From the data we have at present, I would say so, yes.
Q. You say it does not terminate the north dipping vein?
A. Not on its strike; it does on its dip.
259 Q. Do you find the north dipping vein on its strike westerly, on what is shown on this model?
A. We do.
Q. Where, in what claim or claims?
A. In the California Claim, of the West End Mining Company.
Q. How far westerly of what is shown on this model is it disclosed, if you know?
A. Well, possibly no further west. It is interrupted here by a fault and offset to the north.

Q. Well, where dod you find it in the California?
A. Where this stope is in the vein.
Q. Now, turning to a stope shown on the model, the most westerly, in yellow?
A. Yes.
Q. Now where do you find it in the California further West?
A. Where the stope is in the California ground.
Q. Is now?
A. Yes.
Q. And has it been developed westerly of what is shown on this model?
A. Yes, but in a different position.
Q. Where?
A. North of this stope. If you notice the yellow here is terminated against what indicated a fault.
Q. Yes. A fault.
A. Yes. That color does not appear to be a fault,——
Q. Well this color is purple?
A. I mean this line.
Q. Oh, yes, I see. Where beyond that point westerly do you find this north dipping vein?
A. We find it at the same depth only, but offset to the north.
Q. And how far to the north about?
260 A. Oh, it won't show on any of the maps.
Q. Well approximately?
A. Well one hundred feet approximately.
Q. Well how is it developed there by what cross cut or winze or shaft?
A. By a cross cut in trachyte and in about this position. (Indicating.) By a cross cut west of the present stope to the north in trachyte and by an upraise from this cross cut.
Q. It is encountered in the upraise from the cross cut?
A. Yes.
Q. Has the work been *drived* westerly on that at all?
A. Not so far.
Q. Is that a recent discovery?
A. Yes, quite recent.
Q. Where, you have it in the upraise in the California, is it connected with the stope shown upon this model?
A. The two segments of the vein have not been connected in the fault up to the present time.
Q. In your opinion is the vein discovered in the upraise which you have referred to in the California ground, a part and portion of the same vein shown in yellow on this model?
A. No question in my mind but that it is.
Q. Is that portion of the vein which is disclosed in the upraise which you have referred to,—has the vein there been followed up to the cap rock?
A. No; it is being followed in that direction.
Q. You spoke of raise 4, I think, as being the raise that had

been made before, as driven up some distance before the settlement of the old McNamara litigation, is that correct?

A. No I should have said 5-A; I referred to it throughout as 4A and it should have been designated 5-A.

261 Q. You spoke of having been called in conference with some of the West End people shortly after this suit now on trial was commenced, at which time you stated that your opinion was the same as it had theretofore been. Did you at that time refer to that 5-A raise?

A. I did.

Q. Up to that time, I understand you to say that you regarded that as probably a local condition, that vein here on up into that raise?

A. Yes, and at that time.

Q. At the time of the conference you still so regarded it?

A. I did.

Q. Did the fact of that raise, the 5-A raise, being driven up and the north dipping vein above the line of juncture between the north dipping and south dipping veins, have anything to do in leading you to directing the making of other and additional raises, in order to ascertain whether what was revealed in the 5-A raise, was a local or general condition?

A. Yes, it did.

Q. Was it at your suggestion that this was—or your advice, that these additional raises were put, that have been put up?

A. It was a suggestion of mine,—not entirely mine; that is, it was advised by others.

Q. Did you after that conference find that you had any difficulty in finding the old 5-A raise?

A. Yes, it took some time to find its old location. There had been waste filled in around there, and it was difficult to locate the raise.

262 Q. You remember which raise in order was next put up after you decided to make further raises to decide what the facts were.

A. There were several started. If I remember correctly both 5-A and 2-A. I would not be sure of those numbers in the order that they were made.

Q. Leaving these raises now, I call your attention to that portion of the model that lies immediately east of the main frame, in which the main part of the model is included, shown here in yellow, and going up from a yellow drift or level. Have you been up that?

A. I have not.

Q. You have not been up there?

A. No.

Q. At the time the McNamara suit was pending, before its settlement, do you know whether a model was prepared by or for or on behalf of the McNamara company?

A. There was.

Q. What kind of a model was that wood, or glass or what?

A. Wood, a solid model.

Q. Did you prepare it?
A. You mean actually con-truct it?
Q. Yes.
A. No, I did not.
Q. Did you have anything to do with the construction of it?
A. Not in the actual labor.
Q. Now, any suggestions about how it should be constructed?
A. Yes, at different times in connection with others.
Q. And did you see it after it was completed?
A. Yes, sir.
Q. I will ask you whether or no—I will change that question so that it won't be leading—on that model what was represented as the easterly termination or end of what was then supposed to
263 be the one vein?

Mr. Lindley: The model is the best evidence.
Mr. Dickson: Well, I understand it is in California. I don't know.
Mr. Lindley: That is not our fault.
Mr. Dickson: No, and it is not our fault. It is out of the jurisdiction of the Court, and I understand the rule of evidence to be that where a document, even, is beyond the jurisdiction of the Court, a witness who has examined it and knows its contents can testify to the contents of the document. And I am very well satisfied that I find authority upon that, if it is controverted.
Mr. Lindley: It is not worth while.
Mr. Dickson: All right. Read the question.
(The reporter read the question.)

Q. How was it shown on the model, that eastern termination?
A. As a fold or a roll, more properly speaking.
Q. A fold or a roll, in what direction? I am speaking of the eastern end of the——
A. The termination easterly did you say?
Q. Yes?

The Court:

(Q.) That is westerly over there, Mr. Chandler.
A. Yes, I know it is, Judge. It was shown as an anticline—anticlinal fold, with what we termed a toe here at the old McQuillan shaft.
Q. The old McQuillan shaft?
A. Yes, just east of the old McQuillan shaft.
Q. You are speaking of one place and pointing to another is why I asked you.
A. Yes, I beg your pardon.
264 Q. Just describe how that toe, as called, was shown upon the model? How was it represented on a level?
A. The model could be taken apart down to the plane of the vein, which surface was painted red, and with numerous faults shown, the fault plane being painted, I believe, blue, and as that model was—as construction was carried easterly down into this ter-

ritory immediately east of the old McQuillan shaft, the surface of the vein, the one vein, as we supposed then, was shown in the shape of the toe of a roll. In other words, you could come around from the south dipping side on a curved line to the north east, and more northerly dipping——

Q. On one and the same level?

A. On one and the same level.

Q. And was it your opinion at that time that that was the termination of that vein in its course easterly?

A. I believed that the evidence justified the assumption of the toe of a roll. And that would not mean, necessarily, the termination of the vein on the 400 level, as it was still dipping easterly.

Q. Now, has the subsequent developments shown that you had no toe there, and if so, how have they shown that?

A. They have shown that very clearly by the east drifting on the south dipping hanging wall, and the south east drifting on the north dipping wall continuously, and has shown that instead of one wall coming around into the coincidence with the other and forming a common hanging wall, that they maintained their average strikes, and drifting upon the south dipping hanging wall, in connection with the stopes and raises has shown it to be continuous, not
265 only to the east end line of the West End claim, with an approximate east and west strike and south dip, but continuing also into the adjoining stope of the Tonopah Mining Company directly to the east.

Q. Do you remember whether on that model the 5 A raise was shown?

A. I think not, Judge Dickson. I am not absolutely certain, but I think it was not shown.

Q. Of course, there were no raises—if that was not shown there were no raises shown on that model that had been projected up in the han-ing wall of what you now call the north dipping vein above the top of the south dipping vein?

A. No.

Q. Can you, Mr. Chandler, give us a little sketch on paper or the blackboard—on paper would be preferable, the appearance of that toe as shown on the model on that 400 level?

A. It is a pretty hard thing to show. It would be in at least 3 dimensions.

Q. I do not mean to be at the same scale that the model was?

A. I can show you what a section would look like through that toe or a plan. A plan would probably illustrate more clearly.

Mr. Peck: You had better take a piece of paper, Mr. Chandler.

Mr. Dickson: I have not offered any testimony, Mr. Lindley, so far because I thought it unnecessary. I would like to have your idea about it, as to the continuity of the ore from what we call the
266 top of the south dipping, vein, the continuity of the ore from there, and the vein, down to where the alleged trespass was committed.

Mr. Lindley: Continuity on what you call the strike?

Mr. Dickson: What we call the dip.

Mr. Lindley: I do not suppose there is any question about that.

Mr. Dickson: I supposed not, and have not offered any evidence on that.

Mr. Lindley. I think the model itself is evidence of that.

The Witness: This, of course, does not amount to anything. There is a plan which illustrates what the toe would be like, and the section would be just exactly the same; all you have to do is to revolve it and you are looking at a section.

Q. Start on the 400 level and walk around from the south dipping to the north dipping without interruption?

A. That is right.

Mr. Lindley: Why don't you- plan map of the 400 level show that just as well as that?

Mr. Dickson: Well, I just wanted to get at what he model shows. I have never seen the model. I think that is all.

Mr. Colby: That ought to be labeled, "Chandler 2."

Mr. Dickson: All right; yes.

Cross-examination.

267 Mr. Lindley:

(Q.) Does that show a different situation from what is shown on the plan map, showing the 400 level?

A. Yes, it does.

Q. In what way?

A. On the sketch I have brought a curved line around here showing the change and a continuous tracing on the hanging wall from the north east dipping vein to the south vein. The map shows a continuation of the hanging wall of the north vein extending out through here (indicating). The south vein also shows the same condition.

Q. Your idea is that the point of the toe extended further around and colored yellow, is that it?

A. No, not at all.

Q. There was no toe?

A. There is no toe.

Q. All right. How recently have you seen that model?

A. Several years; I don't know, two or three.

Q. You know where it is now?

A. No, I do not.

Q. Have you had any previous experience in the Tonopah district before you come up here in connection with the MacNamara litigation?

A. Yes, I had had a limited experience in the MacNamara mine. By MacNamara, do you mean the West End MacNamara controversy?

268 Q. Yes.

A. The answer is correct then.

Q. You did not occupy any official capacity in connection with

the McNamara mine, that is, so far as its executive work was concerned until the litigation started?

A. No, I did not.

Q. You were brought here for the purpose of that litigation?

A. Yes, sir.

Q. About the same time I was?

A. I think at the same time.

Q. Well, that was a controversy between the West End Mining company and the McNamara, in which the West End mining company had commenced a suit and secured an injunction against the McNamara working on the north dipping vein?

A. It was.

Q. The question that you and I had to determine at that time was whether there was any apex to the north dipping vein, that would justify the suit?

The Court: Judge Lindley, I do not quite understand this. Do you mean to say that you and Mr. Chandler came in connection with the West end litigation?

Mr. Lindley: Yes.

The Witness: Judge, there was a previous suit between the Tonopah Extention and the McNamara.

Mr. Lindley: Yes, I had overlooked that.

Q. How long between the two suits was it?

A. I cannot tell you the time; it was quite a period of time, more than a year.

Q. Well, at what period of time did you take charge, as Superintendant of the McNamara mine, for the sake of participating in the first instance in the management of the mine; was that before

269 or after the West End litigation?

A. Before.

Q. Had the West End litigation been commenced at the time that you were made Superintendant?

A. No, not as I remember.

Q. Well, there was a prior controversy then between the West End and the Extention?

A. There was.

Q. That was also settled?

A. Yes.

The Court:

Q. Between the McNamara and the Extention?

Mr. Lindley: Yes.

Q. How was that settled?

Mr. Peck: I object to that if the court please, it may have been settled between themselves perhaps, and to their own liking and to their own interest. Certainly neither party to this litigation is bound by it.

The Court: The objection is good, unless it is just preliminary matter.

Mr. Lindley: It is preliminary.

The Court: The objection is overruled.

Mr. Lindley: I will withdraw the question to save a speech. I had forgotten about the Extension litigation.

Q. You, were, however, the superintendant of the McNamara at the time that the litigation started?

A. Yes.

Q. And the contention in that case on the part of the West End was that they had the apex of the north dipping vein?

A. It must have been.

Q. And they secured an injunction against the McNamara to prevent them from working on the McNamara on what they called the north dipping vein?

A. Yes, they did.

270 Q. And the question to determine was the question of whether they had an apex on that north dipping vein?

A. Exactly.

Q. How long was that case in progress?

A. That I do not know; I should say fully a year, judge, perhaps longer.

Q. Were both sides working actively during all of that period for the purpose of preparing for trial?

A. Both sides were doing work and principally in their own ground; entirely in their own ground I might say.

Q. Work of what nature?

A. We were making upraises to the south in our vein at intervals. The West End company by development was trying to get into the vital territory so that they might likewise do litigation work, and they did some; there was not very much work done on either side.

Q. Do you recall a drift which you used to call the apex drift on the West End ground, ground for the purpose of establishing an apex?

A. That we called the apex drift?

Q. A drift along a common boundary line, between the two claims made by the West End company?

A. Do you remember on which level?

Q. Well I should say corresponding to the two hundred level in the McNamara?

A. They drove the two hundred level west during that period a certain distance.

Q. Did they make upraises from that level?

A. Yes, they made one perhaps two; I think no more than that. My memory is not altogether clear in regard to the work during that period; there have been so many periods here of litigation, I am liable to run one into the other.

271 Q. I will see if I can refresh your memory as to the locality and as to your investigation of that particular drift. Do you recall having made any statement of this kind, and if so I wish you would point out on the model what you have reference to: "Was down in the West End to day; started record on the work that they are doing; I found on careful investigation that in the west upraise,

along the side lines, beyond the point of connection with our two hundred level, south cross cut upraise, that the West End people have deliberately left the vein in the foot of the raise; the hanging wall as the vein comes back is splendidly defined under the floor of the raise and they have followed the contact line between the earlier andesite and the cap, and are still driving ahead; there are some small stringers of quartz in the earlier andesite in the raise in spots the earlier andesite is very silicified and altered, but the vein is under the floor of the raise; they are evidently figuring on misleading somebody and will perhaps try to make a vein tracing by the stringer and altered andesite up the raise to a final ending of quartz, etc." "We can bust up any apex showing claimed in this raise by the winze from the raise down under the floor of the vein." Do you recall that?

A. That is perhaps a copy of a letter of mine to you, and I recall the situation very clearly.

Q. I beg pardon it was not to me.

A. Well, it sounds like a letter of mine. That is immaterial. I can recall the work.

Q. Please point it out.

A. First this raise from 202 West drift, which had encountered a vein at this point dipping southeasterly and on which they started to raise; at this point if you will notice it goes into the floor of
272 the raise, which raise continues in trachyte to this level.

Q. You had better number them and give the markings on the model.

A. Well, I said 202 West drift, encountered a vein in the neighborhood of 254 upraise and the raise 258 was started in that vein, but carried into the hanging wall, the vein disappearing in the front of this raise, and not seen, I believe, as far as their development work after that. This was the only vein showing on that level at that time.

Q. Who ran the 5-A raise?

A. The 5-A raise?

Q. Over here in the West End eastern territory.

A. The West End mining company.

Q. At what time?

A. Since the suit brought by the Jim Butler Company was instituted.

Q. 5-A?

A. Oh, 5-A, I am confusing it again with 4-A. 5-A raise was put up by the West End company.

Q. Was it in the McNamara ground?

A. 5-A?

Q. Yes.

A. 5-A is in the West End ground.

Q. And when was that put up?

A. I do not know.

Q. Was it put up at the time that the litigation had been started?

A. When we were examining this country we found that raise.

Q. Did you investigate it carefully?
A. Fairly so, as far as I was concerned at the time.
Q. You say that you paid no particular attention to it?
A. In connection with what we believed to be one vein forming a roll, we did not take it seriously.
Q. What do you mean by 'me'?
A. Myself and engineers and geologists who were employed at that time by the McNamara Mining Company.
273 Q. Who were the engineers?
A. Chas J. Moore.
Q. Anybody else?
A. Professor Andrew C. Lawson.
Q. Professor Lawson.
A. Yes, of the University of California.
Q. Do you recall your discussion of this matter with professor Lawson, this particular raise?
A. I do not think I discussed it with him, as to what moment he considered it to have.
Q. I understood you to say that "we" did not consider it of importance, and I asked you who "we" was and you said Mr. Moore and Professor Lawson.
A. Well I had been in there a number of times but the particular visit that I had in mind we were only in there a very few moments, and it is more of an opinion than anything else. There was not very much time spent in it.
Q. What did that go up on,—that raise?
A. It went up on a vein having a north dipping hanging wall.
274 Q. And you knew the West End were hunting for that kind of a vein, did you not?
A. Knew the West End were?
Q. Yes.
A. Yes, I supposed they would be, if they were trying to apex the MacNamara.
Q. That had been put up by the West End company?
A. It had.
Q. Now, you have a series of raises along there, 5A—enumerate them.
A. 2A, 4A, 5A, 6A, 7A in that locality.
Q. How many of those raises were put up by the West End Company during the old litigation?
A. During the old litigation?
Q. Yes.
A. I don't know that any of them were. I said we found 5A extended—I found 5A driven to the height previously described the first time I went in there after the suit was instituted.
Q. You do not know whether the MacNamara put that up, or whether the West End——
A. Didn't put that up during my time, so far as my knowledge is concerned.
Q. It is in West End ground?

A. It is.

Q. The assumption is it would not have been put up by the MacNamara people?

A. The presumption would be that they did not.

Q. Who else could have put it up, except the West End people?

A. Except the West End people? Well, I am quite sure
275 that it was put up by the West End people.

Q. You said you did not know who put it up. You are satisfied that they did put it up?

A. If I made that statement, I had in mind the Particular administration, whether Mr. Corkill or Mr. Carr had it put up. So far as my knowledge is concerned, it was certainly put up by some one in charge of the West End Mining Company's affairs.

Q. Well, the management changes but the company don't.

A. I see.

Q. So that you are satisfied that that raise was put up by the West End?

A. Put up by the West End Mining Company, yes.

Q. Claiming an extralateral right on the north dipping vein?

A. I don't think they ever made any claims on it.

Q. Well, they commenced a lawsuit against the MacNamara Company, didn't they?

A. They did, yes.

Q. That is on a north dipping vein?

A. They did.

Q. The activities of the MacNamara at that time were in the west country, were they not?

A. Yes, principalpy. The reason I answered I didn't think they based that litigation on that——

Mr. Dickson: On what?

A. On this showing in 5A. raise, is because I do not think they paid any more attention to it than the MacNamara Mining Company
did, or they would have gone ahead with their raise to establish
276 that, if they thought that was an apex.

Mr. Lindley:

(Q.) You know that at that time they were claiming the apex of the north dipping vein, and claiming the ore bodies in the MacNamara ground on that vein?

A. Yes, they were.

Q. They did not take you into their confidence to tell you what they were claiming it on, did they?

A. No, that is quite true.

Q. And you had to guess, we all had to guess just what their contention was.

A. I did, yes.

Q. And your object in life about that time was to show that there was not any such north dipping vein or an apex of a north dipping vein that would give them an extralateral right to take the MacNamara bodies?

A. Yes.
Q. That is what you were there for?
A. That is what I was after.
Q. Now, 5A, then, was run at some time prior to the litigation, or was there when you made your investigation, you do not know when it was run? How many other raises are there parelleling that in that immediate vicinity? You did not know when it was run; it was——
A. No.
Q. When you came on to the ground it was there?
A. Exactly.
Q. Now, how many other raises are there parelleling that raise in that immediate vicinity?
A. Well, there are four that are driven approximately parellel to that raise, in that immediate vicinity.
277 Q. When were they driven?
A. They have all been driven since the institution of the present suit.
Q. Who instructed them to be driven?
A. Mr. Brady, the general manager of the West End Company.
Q. Under whose advise and direction?
A. Under the advice of the engineers employed in the controversy.
Q. Plus anybody else?
A. My own advice.

Mr. Dickson:

(Q.) I cannot hear.
A. Plus my own recommendation.

Mr. Lindley:

(Q.) Now, let us go back to the background of these running supplemental upraises. I understood you to say that you entered the employ of the West End in the first place in a consulting capacity, for examination about their properties, and consulting them in connection with the workings of the mine. At that time, who was the general manager of the West End?
A. Mr. S. H. Brady.
Q. Where is he now?
A. I do not know.
Q. You succeeded Mr. Brady, did you?
A. I did; not as general manager, however.
Q. No, they reduced the name of the office, I suppose?
A. Yes.

Mr. Dickson: How is that?
Mr. Lindley: They reduced the name of the office from manager to superintendent.

278 Q. Well now, what were your functions—at the time you were first employed by the West End Company, you were not employed in the capacity of superintendent?

A. No.

Q. What were your functions and duties?

A. The understanding of that employment of me was that I be subject to call at any time that I was in the camp to advise on any underground situation or complexity that might arise, and at the same time, if called upon to make outside examinations for the Company.

Q. Were you under a regular salary or were you to be paid simply for your work as it was done?

A. I was under a regular salary.

Q. Which included fees for examination outside?

A. That was to be extra, outside of the camp.

Q. You had a definite salary, then, as consulting engineer, involving the workings of the West End Company?

A. I did.

Q. And were you frequently consulted by Mr. Brady?

A. Not at all so.

Q. At the time you were employed as consulting engineer—during Mr. Brady's administration, you were not consulted, is that it?

A. Only several times; a couple of times, perhaps.

Q. Well, can you tell us what that consultation was about?

A. Those several instances?

Q. Yes.

A. In regard to the structural conditions underground, as to my opinion of a certain situation; what work I thought ought to be done to get the best results.

279 Q. How many occasions of that kind were there?

A. I really do not remember, Judge. There were very few.

Q. You never undertook to do anything unless Brady called on you, did you?

A. No, I did not.

Q. And he called on you rarely?

A. Yes.

Q. Do you recollect the period of time, the exact date of your employment by the West End in the first instance?

A. I could look that up for you, Judge.

Q. What is your impression?

A. Of what?

Q. Of the time?

A. Four or five months, I think.

Q. Four or five months ago.

A. No, previous to this——

Q. To this litigation?

A. Litigation.

Mr. Lindley: Mr. Clerk, what is the date this suit was commenced?

The Clerk: April 6th.

The Witness: The West End Company's office records will fix that time definitely, if you wish it.

Mr. Lindley:

(Q.) You knew the position of the underground works of the West

End Company, that is, in the lower regions of its works at the time you became employed as consulting engineer?

A. No, I had not been in it.

Q. Do you know whether or not their works had reached underneath the Jim Butler surface?

280 A. I didn't know that, either.

Q. You did not know that?

A. Just a minute; I will consider that a moment. You asked whether at that time of my employment, I knew whether or not the West End workings had reached the Jim Butler line; was that the question?

Q. Yes.

A. I didn't know it of my own observation. I had heard so.

Q. You had heard so. From whom did you hear it?

A. I can not recall where I did hear it first. It was heard casually.

Q. Did Mr. Brady tell you?

A. First?

Q. At any time?

A. Yes, in going over the maps, it was perfectly apparent later on.

Q. I mean before your employment in connection with this litigation?

A. I don't think Mr. Brady ever told me.

Q. But you think at that time they had reached the boundary line of the Jim Butler?

A. It seemed to be a fact more or less commonly known. I heard it mentioned, but as I say, I had not verified it. Later on, when I saw the maps of the Company, the stopes showed for themselves.

Q. Well, at the time of your original employment, you had no idea at that time that there was any controversy coming up between these two companies?

A. I had not, no. I had understood that certain differences in regard to mining across the south boundary of the West End had been adjusted by agreement.

Q. Across the south boundary?

281 A. Of the West——

Q. Or the south side line?

A. Yes.

Q. Well, that had reference to what vein, if you know?

A. I have heard it said the south vein. I didn't know what vein.

Q. Can you identify that vein on the model there?

A. Well, in that region there is but the one vein, so I suppose that——

Q. In what region?

A. The south west portion of the territory.

Q. There is only one vein?

A. Only one vein, yes.

Q. And you disagree with Mr. Wiley as to that?

A. I call this south. I recognize the south branch of the south vein, not calling branches separate veins.

Q. Then, is the Fraction vein a branch vein?
A. I consider it is.
Q. Therefore, it is a part of the main vein?
A. I would so consider it.
Q. It is not a separate vein?
A. I don't think so.
Q. Well, I understood you to start out with the statement that there were three veins in this property, and you have given us two; where is the third?
A. It is the vein encountered lower down in the shaft on the 8 and 9——

Mr. Dickson:

(Q.) How much lower down, if you do not object?

Mr. Lindley: I do not object to anything that you do,
282 Judge.

A. Encountered in the shaft about 550 feet lower.

Mr. Lindley:

(Q.) Is that what they call the lower contact?
A. I believe it is designated so.
Q. That cuts no figure in this case?
A. I believe not.
Q. You left us guessing as to what you meant by a third vein and I thought I would bring it out. And eliminating your lower contact, you do not think there are but two veins on the property?
A. With the explanation that I just made in regard to the south branch of the south vein, the Fraction vein.
283 Q. Well, you say that they are all one?
A. Yes, that is right, two veins with the exception of that lower one.
Q. How thick are they at the thickest point? What would be the thickest part of this vein which you include in your designation as the south dipping vein. How thick is the ore body, how thick is the vein?
A. Well, it is a very wide vein, we are stoping widths, and there have been widths stoped recently as wide as twenty-five or thirty feet, perhaps more. In other places it is stoped to a small width, as, oh, five or six or seven feet.
Q. Take from the hanging wall of the fraction vein to the foot wall of the lowest vein, what is the vertical distance?
A. From the hanging wall of the fraction vein?
Q. Yes, to the lower working of the——
A. At what point?
Q. At the thickest point?
A. Thickest point on which vein?
Q. You say that there is only one?
A. Well, but you are having me now consider the fraction vein, as a branch of it?
Q. You say that it is all one vein.

A. I say that it is a branch of the south dipping vein, but I do not give it, or I do not distinguish it on that account as a separate vein. It is a branch vein, if you want to consider it a separate vein I am perfectly agreeable.

Q. Mind you, Mr. Chandler, you are testifying.

A. I am trying not to——

I consider it a spur or a branch, Judge Lindley of the main south vein, and only that, I do not designate it as a separate vein in that connection. It has a separate name we know it as the fraction vein.

284 Q. Well, what is there between the two?

A. Well rock.

Q. Mineralized?

A. In places.

Q. From the bottom to the top?

A. Of what?

Q. Well, from the bottom branch to the top branch?

A. No.

Q. Vertical?

A. No, not that I am aware of.

Q. Then you do not think the Fraction vein ought to be classified as a distinct vein, it is simply a branch of the main vein, that is a way you engineers have of designating these things as branches, spurs?

A. It is a vein designated as the Fraction vein, is found at a considerable distance from the main West End vein, but on our four hundred level in the territory of 422-S and as it is followed down approaches an intersection with the main south vein, and is at the present time within a few feet of being connected.

Mr. Lindley: Well, I do not understand Mr. Dickson, this is addressed to you particularly, that any part of this alleged trespass by the Butler Company, is on what we call the Fraction vein?

Mr. Dickson: The alleged trespass by the Butler company?

Mr. Lindley: By the West End Company in Butler surface.

Mr. Dickson: That is my understanding, that it is on the main south vein.

Mr. Lindley: And above the junction of the two branches, if you call them branches? That is my understanding.

Mr. Dickson: That is my understanding too.

Mr. Lindley: That Fraction vein cuts no figures in this
285 case, so far as this case is concerned.

Q. The geological feature as I understand it, Mr. Chandler, that is involved in the discussion of the structural conditions; is that right?

A. Yes.

Q. And the same way with what you call the south branch?

A. Yes.

Q. Now, we will come back to the point where you emerged out of the employment of consulting engineer——

A. Pardon me just a minute—you said that it cut no ice in this litigation, in this suit.

Q. I mean so far as the damages are concerned.

A. You apply that also to the south branch of the south vein?

Q. Yes.

A. It differs in that respect from the Fraction vein in that it may cut some ice in this litigation, the south branch of the south vein.

Q. It may. Well, we have not been adbised if it does.

A. I wanted to make that explanation however as distinguishing it in that respect from the Fraction vein.

Q. I would like to ask you what you mean by that?

A. You want to know what I mean by it?

Q. Yes. You said that it may cut some figure?

A. Because there are workings in the south branch of the south vein, south of the south side line of the West End company's ground; and I do not know anything about it but it occurred to me that it might, on that account be involved perhaps in an alleged trespass, and extraction of ore.

Q. That is a legal question fir the lawyers to settle isn't it?

A. Yes, I believe so.

Q. No, justification in the pleadings for anything except this vein one vein, however, we will pass along now. Now, I want to get back to the time where your relationship to the West End
286 company merged from Consulting engineer and outside investigator to the point of time when they approached you with reference to a change in the nature of your employment. How long after you had been originally employed in the capacity of consulting engineer was the subject of controversy with reference to this vein broached to you and by whom?

A. Well, almost at the same time that the suit was instituted or a few days after that. I was called by Mr. Brady and had a conference with him.

Q. I believe you stated in direct what your statement was, you did not state it was to Mr. Brady, but it was with Mr. Brady that you had this first conference?

A. Yes.

Q. This was after the suit was brought?

A. Yes, sir.

Q. What was the nature of the conference so far as your employment was concerned?

A. Any rearrangement?

Q. No I do not care anything about your financial conditions at all. I mean in reference to your duties, and in reference to this controversy. I do not care anything about the money nature of it at all.

A. I was asked to tell him what I thought of the situation.

Q. Didn't you?

A. I did.

Q. What did you tell him?

A. I told him of the position that I had taken and believed in

in the case of the McNamara against the West End, and that I had not seen any developments since to lead me to change my views.

Q. Did you tell him at that time that in order to change
287 your views you would have to do a whole lot of work?

A. I told him that it would certainly be necessary to bust up this apparent toe to a roll, and to show that no roll existed, if he were to have any case in my judgment.

Q. Had you in mind at that time how you were going to bust it up?

A. Well, I was going to develop the fact in this east territory where we believed a toe to exist, by east drifting on both of the hanging walls, and see whether or not they would unite and form one common hanging wall.

Q. What did you say to him about that 5-A upraise?

A. He asked me—I didn't even remember that, when we had our first conversation, but several days later I recalled it and I went to him and I told him I knew of a certain upraise that we ought to look up and see what we thought of it.

Q. Why?

A. Because that was the only place that I knew of where there was any development other than the apparent fold in the west end of the ground, and this apparent toe that would shed any light on the situation.

Q. Brady knew of course that you had been employed by the McNamara in the former litigation, did he not?

A. He did, yes.

Q. You suggested to Brady right hot off the bat that that was a good place to start in work?

A. Not right off the bat.

Q. No, not right off the bat?

A. No, after several days' deliberation.

Q. Did you go down into the mine with him?

A. Yes, sir.

Q. At that time?

A. I think the first day I mentioned it to him.

Q. Was that the first place that you went to?

288 A. I really could not say.

Q. Don't you recall that trip now; where did you go; what started you; what drew your attention to the condition of that upraise; what had there intervened between the time that you left the employ of the McNamara until you assumed the position on this litigation, what had occurred to call you- attention to that upraise, if anything?

A. Because, if I recall the conversation correctly, he asked me if there was any showing whatever, or any place that seemed to argue against my theory of a perfect anticlinal roll or fold, and that was the way that it came up.

Q. That upraise?

A. I said that was the only place that I knew.

Q. And yet at the same time you testify that when you were

making a fight for the McNamara company, you paid no attention to that?

A. Paid very little attention for the reasons stated.

Q. How long a period elapsed between the time that the litigation of the McNamara Company and the West End ceased, and the time when you took this upraise matter up with Brady? How many years?

A. It was a number of years, Judge, three or four years anyway.

Q. Wasn't it longer than that Mr. Chandler?

A. It may have been. I would have to look that up.

Q. Well, we were busy as I recall it in January, 1908, on this apex question.

A. With the West End?

Q. Yes.

A. 1908——

Q. That is the date of your letter January 1st——

A. Well, I was here in Tonopah,——

289 Mr. Colby: January 15th, 1908, is the date of the letter.

A. I was away from Tonopah approximately three years, between 1910 and 1913, and returned to the camp last October.

Mr. Lindley:

(Q.) Well, it is five or six years?

A. That would make it nearer five years than three.

Q. Nothing in the meanwhile had necessitated calling your attention to this upraise?

A. No, I had not been in the camp for three years.

Q. Forgotten all about it?

A. I had practically.

Q. That was the first *natter* that brought it up?

A. About my employment?

Q. Investigating the merits of this controversy between the Jim Butler and the West End?

A. No, it was not the first thing, as I understand—I didn't recall that raise for several days after he called me in for the first conference.

Q. I mean that you did recall that out of the recollections of six years?

A. I did.

Q. And the result of that,—some parallel upraise- were put up?

A. Yes.

Q. Will you designate those parallel upraises; designate them so that we can get them in the record.

A. 2-A; 4-A; 6-A; 7-A in that vicinity.

Q. What is there shown in any one of them that is not shown in 5-A?

A. Practically nothing judge. There is a feature in 5-A however that is not shown in the others.

Q. What was the object of running so many?

A. Well, to show how extensive this condition in five-A was.

290 Q. Wouldn't a drift be much more economical and much more satisfactory than a number of upraises of that kind?

A. There would be a danger in that because the top rock is very irregular, and the surface under it, with numerous faults, and you would be very apt to get into trouble running an intermediate drift, and attempting to work from that.

Q. If you were mining that ground you would not run that number of upraises?

A. For stoping purposes?

Q. Yes.

A. No.

Q. You would not?

A. As far as this drift is concerned this raising could be done far more advantageously.

Q. Well, practically, as I understand your testimony,—I want to be perfectly fair with you for a great many reasons.

A. I want to be the same with you certainly.

Q. Practically there is not anything shown in the supplemental raises except what is shown in 5-A?

A. That is practically the case.

Q. Why did you run so many of those raises right at that section of the mine?

A. Well, I did not space those raises. I had nothing to do with it. They were run there, as I say, manifestly with the object of finding out in this territory back of the alleged trespass, whether this condition in 5-A was purely a local one, or whether it had a chance to develop into a general condition.

Q. Are those raises run on a hanging wall?

A. They are.

Q. Where is the foot wall of the vein that is shown in those raises?

A. In places in the raises it is in evidence; in other places the width of the workings does not show,—the height of the
291 working does not show the entire vein.

Q. What is there below the bottom of the vein?

A. In any particular raise?

Q. What is the character of the intervening rock, between the hanging wall, shown in these raises, and the stope, or the red vein below?

A. Well, there is wall rock.

Q. Unmineralized?

A. Well, very slightly mineralized in the foot-wall of the vein, as exposed in these raises.

Q. Is there a clean foot wall shown in any one of those raises?

A. I have not seen one.

Q. You have not seen one? Then how do you know what is underneath?

A. We have a connecting raise here. It has no number, it is practically a vertical raise, located almost directly under 5-A raise, which raise starts on the back or hanging wall of the stope below in the south vein, and is driven to a connection through country rock to the vein in 5-A raise.

Q. Absolutely country rock?

A. What do you mean by absolutely country rock?

Q. Nonmineralization, nonsilicified—no quartz at all.

A. It is slightly silicified trachyte, as I find in a number of localities in the mine.

Q. Isn't it a fact t-at you put those upraises there because that is the only spot in the mine where you could get that result?

A. This raise, 5-A?

Q. Yes.

A. No, because we have the same result in other raises.

Q. Where?

A. 302 for one.

292 Q. Now let *is* take 302, tell us a little about 302.

A. Well, 302R, starts from 302 east drift and follows a south dipping vein.

Q. And——

A. And at the point indicated by the change of color, encounters heavy massive quartz, belonging to the north dipping vein, whose hanging wall is encountered as shown, and on which the back raise 366 is continued on the same north dip to a termination of this quartz and this vein against cap rock, about ten feet below the two hundred level.

Q. I notice that you have drawn the line of demarcation between the red and yellow before you turned to the north dipping vein. Why did you do that? In other words as I look at the point that you have just been testifying to, to be on a red vein, and then change to yellow, and still it is south dipping. What justification is there for the drawing of the red line at that point?

A. It is absolutely impossible in this section, this territory of juncture to tell where the north dipping quartz begins or the south dipping quartz ends, in the foot wall, so to a considerable extent that change of color is an arbitrary point.

Q. That is an arbitrary proposition. Is that the same arbitrary proposition applied to the McNamara West End stope in the neighborhood of your raise-A?

A. In the foot wall—yes.

Q. Of the stopes as shown upon the model, and as a line of demarcation is shown upon *on* the stopes——

A. Did you say raise A?

Q. I said underneath raise A. To make the question a little more elaborate Mr. Chandler, you have on your model,—and I have only that way of designating it,—I am speaking of *of* what you

293 testified to, as the original instance of their being evidence to you of a roll in that vein in the workings of the McNamara and West End.

A. Yes.

Q. You recall that circumstance? That was one of the circumstances that there was no question about at that time?

A. As a perfect evidence of a roll.

Q. Yes. Now, what justification have you for eliminating the yellow for the red?

A. For the reason that we follow up on this south dipping vein, it is exposed for thirty feet, and at other points over to here.

Q. Now, we will get lost if you do not identify this. How far are you away from the place that I have called your attention to; measure the place and take the ruler. Now I was asking you about the conditions shown in the stope of the McNamara and West End immediately in the vicinity of raise A and you went over to what point—give me the distance?

A. You mean 302?

Q. Yes.

A. I will give you this approximately. I suppose that is sufficient.

Q. Yes, that is enough.

A. Approximately 440 feet.

Q. 440 feet. Then explain the situation why you have marked one vein red and the other yellow, you go down to a point 400 feet to the east of it. Will you kindly confine your explanation, if you have one to make, as to why the stopes where they come together with the red and yellow, you have eliminated the yellow and marked one red, marking the other one yellow?

A. There is no reason that I can refer to in making an explanation, other than of raise 302.

294 Q. If you permit me to call this a roll as we both used to some time ago—this roll is plainly observable matter, it was when you first made your investigation in behalf of the McNamara and is to day, is it not?

A. As far as what we may term the common stope is concerned,—yes.

Q. Well, what was there, or is there to day that justified the marking of one of those veins red and yellow, and the line there that is marked—observable in those stopes?

A. Just this; that we can and do follow the same hanging wall that we have in this stope up into A raise.

Q. I am asking for a justification for the marking of those lines as they are marked——

Mr. Alling: Just a moment if the Court please, he is showing that A-raise is the justification. And we submit that he be permitted to conclude his answer, because it is directly responsive to the question.

Mr. Lindley: As this is the first time that I have had the pleasure of listening to Judge Alling, you can adopt his suggestion.

Q. Now leaving the raise out and going *and going* to each side,—we are bound to get there sooner or later.

A. Now, Judge Lindley, if we remove A-raise in its entirety we have the same condition to day as we had during that period of the West End Mining Company controversy.

Q. There was no physical line of demarcation to determine one line from the other?

A. Not that I had observed at that time. I believed that it was a perfect fold.

Q. Well, you made some pretty severe study of that situation?

295 A. I made careful study of it.

Q. There was a whole lot involved?

A. In that suit?
Q. Yes.
A. Yes.
Q. The life of the McNamara mine was involved, and you would not miss anything?
A. I tried not to.
Q. I don't think that you did.
A. I am sure that I did. I missed this much Judge Lindley, that I did not observe that at that time that there were several slips in the immediate vicinity of the hanging wall of this stope. I believed that there was one hanging wall joined the two stopes. Careful study since that time has shown me that the hanging wall of this McNamara stope extends continuously up A-raise, over and above the south dipping vein.
Q. Well, if you had made that discovery at that time, the McNamara would have lost out?
A. That I am not prepared to say. On that one development do you mean, it might only have proven to be a very local displacement, and if we had established a perfect fold or anticline, this condition in A-raise would probably have been considered very local, and so I don't know where——
Q. You do not seem to have put any other parallel raises up in that neighborhood?
A. No, the next raise is 302.
Q. Four hundred feet away?
A. That is,—part of that was also put up from the south vein, the portion numbered 302 raise—that part of it.
Q. Well, taking us back to the old days, if that A-raise would have been put up, wouldn't you have classed that in the same class as you did the other raises, and stated that it was a
296 fake raise, to show an apex?
A. No, not at all, I would not have classified it as a fake raise at all. I would have seen the same fact that I do today in that raise, that it actually does follow the hanging wall of the north dipping vein, through the stope.

(Question read.)
Mr. Peck: I object to that as impugning the integrity of the witness.
Mr. Lindley: I want to say now, once and for all that I am not trying to impugn the integrity of this witness, I think that the defendant is a corporation, it has no soul, and it doesn't make any difference. As far as this witness is concerned, I desire to say that he has no substantial reason for changing his opinions.
Mr. Dickson: Well, I think that we have a right to object to the term "fake raises."
Mr. Lindley: Well, I may have converted his language in the letter which I read. He said "endeavoring to mislead" and I should have used his own language and said "misleading." Well, now are we at peace once more.
Mr. Dickson: Oh, yes.

Mr. Lindley:

Q. Now I will ask you if the A-raise is not run precisely on the same slip that that drift was run, for apex purposes by the West End company at the time of the McNamara litigation?

A. On the same what—what did you say?

Q. Fault or slip or whatever you call it?

A. Which drift?

Q. The question you testified to and referred to in the letter. Am I correct about that matter.

297 Mr. Colby: The raise.

Mr. Lindley: Let me have that letter a moment.

A. No it is not.

Q. You are sure of that?

A. I am.

Q. You thought that raise-A in that section of the mine, was the only one that was necessary, is that right.

A. I thought that it was the only raise necessary to show the condition which it does show, that instead of having a common hanging wall for both these stopes, that this hanging wall extended above the south dipping vein.

Q. Why should you put one up there and six down in the other section of the mine?

A. Because the alleged trespass was in that portion of the mine; the extraction of ore and damages claimed, so I presume the West End Company was much more diligent in that portion of the ground.

Q. The West End Company represented by whom?

A. Well, in the laying out and deciding and ordering and inspecting of this work—its general manager was Mr. S. H. Brady.

298 Q. What have you to do with it?

A. In locating it?

Q. Yes. Didn't you take charge of that matter?

A. No, I didn't have charge of it.

Q. Not of the actual working, but the laying it out?

A. No.

Q. Who did?

A. That work was decided on by Mr. Jussen, Mr. Wiley, Mr. Winchell, Mr. Brady and Mr. Richardson.

Q. Well, of course these gentlemen must have got from you the conditions of the original 5 A upraise?

A. I pointed that raise out, as I have testified, to Mr. Brady.

Q. Then these upraises were run by common consent of all the engineers in the case, is that it?

A. Yes, with their approval.

Q. And they thought it was necessary to run 5 or 6 down there, and only one up at the upper end?

A. Well, you will have to ask them, Judge.

Q. Well, what is your part?

A. I can tell you what I thought. As I explained just now——

Q. You have told us what they all thought as to the lower end, as to the lower section, but you have not told us what they all thought about the upper section in the neighborhood of raise A?

A. This work was done first in the east end of the ground, and this A raise work was done later, and we had dropped over on to the south side and had started three different raises with the idea of developing the conditions from the south vein side and made a diligent effort to do that but got into trouble in all of
299 those raises owing to the numberous interferences by faults in this section of the mine.

Q. Well now, speaking of the concentration over at that end to reach the trespass. You know, as a matter of fact, don't you, that there are stopes in the west end of the property that are underneath the Butler surface, and that the trespass is not confined to the east end?

Mr. Dickson: Let me ask you, Mr. Lindley, wasn't it your understanding at the time we entered into a stipulation, that it limited the scope of that injunction to a point 700 feet westerly from the end line. What was spoken of in that agreement in December, 1912, as the south vein, was *was* involved in this suit?

Mr. Lindley: I am afraid you are mistaken about that, Judge, unless I am. When those stipulations were drawn and we drew that north and south line, the injunction did not operate, it was done specifically without any waiver of right to any other part of the vein.

Mr. Alling: I would like to ask Judge Lindley if it is not true that the amendment which he has recently asked to the Complaint was not practically to cover ores in the western area alone?

Mr. Lindley: No sir.

Mr. Dickson: At that time, at the time the injunction pendente li-e was issued, pursuant to our stipulation, and which extended the scope of the injuncion only from the west end line *tline* of the west end claim to a point 700 feet westerly thereof, the West End company at that time was engaged in stopeing of the vein way to the west.

Mr. Lindley: Well now, Judge Dickson, I do not care any-
300 thing about this, but the real fact that that section of the mine was not involved in the south vein contract. My motive was simply eliminating that from the injunctive order, because I did not want to thresh out the merits of that on an injunctive order. In response to the question put by Mr. Alling, let me say that I do not know, Mr. Alling. It was reported by the management of the mines, when I suggested to them that we would have to present our evidence as to the volume and value of this trespass, that they should get their stope cross sections, and they reported to me upon the measurement of the stopes that we had underestimated or understated the volume of the trespass, and I do not know what the management had in mind, whether it was in the east or west, or both. I do not know.

Mr. Alling: I know that two affidavits filed here, which, taken

together with the Complaint and the express statement of Mr. Colby, amounted to an express disclaimer on the hearing of the temporary restraining order as to the inclusion of any ores taken out on the western end.

Mr. Lindley: Mr. Alling, we will go back to the stipulation signed in writing, because I was there. That question came up between Judge Dickson and myself, and I think you were present, and the stipulations will show themselves, because I put in a modification there to protect our rights in that section of the mine. We did not ask for an injunction because it was involved in a contractual relation, and I did not want to mix it up.

Now, whatever is the right thing will be done under the pleadings. I understood that you gentlemen were surprised by the increase in the volume. But it is entirely immaterial. We
301 can thresh that out when the Court determines the title.

Mr. Dickson: Do you misunderstand me. I do not undertake to say that by any action you have waived any right that you have to this portion of the vein. But I got the impression, no doubt as the witness did, that whatever was taken out of this so-called south vein, was not involved in this suit at the time the injunction was issued.

Mr. Lindley: Well, Mr. Dickson, the suggestion is made that this period of time, that those upraises were run before the injunction order was issued, I think.

Mr. Dickson: I do not think so.

Mr. Lindley: We will straighten that out. I see what the witness thinks, that this is the area of greatest activity and the necessity of duplicating upraises to protect the ore bodies below; that is what his idea was, at least. However the lawyers may be mixed on it, the witness seems to be prefectly clear.

The Witness: That was my idea, Judge.

The Court: We will take a recess at this time. The case is continued until a quarter of four.

(Short recess taken.)

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Mr. Lindley:

(Q.) Mr. Chandler, referring once more to this ancient and honorable stope up here, the MacNamara West End stope, in the vicinity of raise A,—and the reason I refer to it as being in the vicinity of raise A is because that is the only marking there is on the model.

A. Yes.

302 Q. Referring to those stopes, did the MacNamara stope over that roll, if you will let me call it a roll?

A. Yes, they stoped to the boundary line.

Q. They stoped clear over to the boundary line which is marked in black on that stope?

A. They took all that was coming to them.

Q. Well, all at one stope?
A. All is one stope.
Q. Is there any difference, any change in the ore shoot?
A. In what respect, values?
Q. Yes sir.
A. Width?
Q. Yes, values?
A. I don't believe that the values were materially different in either the stope painted red or yellow. I say I do not believe that they were materially different; there were, of course, variances, there are every day.
Q. Don't it strike you as being quite common for two veins to unite, but rather uncommon for two ore shoots of the same grade and quality and character to unite?
A. Well, I don't believe I have ever before seen stopes or known anything about the grade in the territory of intersection of two veins, so I am not prepared to say whether that would be an unusual condition or not.

Mr. Lindley: That is your answer. Take the witness.

Redirect examination.

Mr. Dickson:

(Q.) I will ask you to assume that you have two fissure
303 veins forming a juncture in their upward course, and to assume that they were mineralized at the same time, solutions circulating through the fissure, we will say here in the north dipping vein and the fissure also in the south dipping vein, I will ask you, in your opinion under those conditions if there would be anything unusual in the fact that where they met and formed one stope, that you would have the same thickness of ore and the same value on the top of the one fissure as you had in the top of the other fissure in the plane of intersection?
A. That is a long question.

Mr. Lindley: Well, I understood the witness to say that he had not experience enough to answer that question.
The Witness: That is the only situation of that sort that I have ever had anything to do with in an operating way, and based on that, I am not prepared to say whether it is an unusual condition.
Mr. Lindley: That is what I understand. Oh, Mr. Dickson, I have omitted something; will you permit me to return to the cross examination?
Mr. Dickson: Why, certainly. I may have to ask the same favor often.

Mr. Lindley:

(Q.) Do you know a fault any where shown in this mine called the Polaris fault?
A. We have that name applied to a certain line of faulting. I was not aware that it was a common term, however, in the camp.

Q. Well, you have heard it called Polaris fault?
A. Yes, I have heard a certain line of faulting referred to, and we have named that the Polaris fault.
304 Q. Jocularly?
A. Not at all.
Q. Seriously?
A. Seriously; in order to have a name for it.
Q. Well, now, where does that Polaris fault figure on this mine, or any portion of it?
A. It coincides with the plane of the north vein for a considerable distance; how far, I do not know, because I have not traced it.

Mr. Dickson:

(Q.) What portion? Point it out.
A. The hanging wall in all these raises, and in other workings show- certain signs of movement. Gouge, with markings and carrying, in a great number of places, a certain width, from a few inches to a foot or more of typical breccia. And that plane of faulting we—I say we, the engineers of the West End Company, have named our selves the Polaris fault.

Mr. Lindley:

(Q.) Are those upraises put upon the Polaris fault?
A. They follow the hanging wall of the north vein, which I have described as the line of that faulting, yes.
Q. Polaris fault. How far does that fault extend down in the mine—any part of it?
A. Well, there are no workings below this——
Q. How far does it extend to the West? I understood you to say that there were no workings to indicate it. Can you trace that fault through these mine workings?
A. I am balled up there. There seem to be several questions, Judge.
Q. Can you trace the Polaris fault, other than what is shown in those upraises? Can you find it anywhere else?
305 A. I have never traced it beyond this Edwards fault. It may on the displaced segment of the vein Northwest of the Edwards fault be again in evidence. There is evidence of faulting on the hanging throughout——

Mr. Dickson:

(Q.) The hanging of what?
A. The hanging wall of the North vein throughout this territory. Whether or not it is a separate faulting, or whether it is a continuation of this same fault, I do not know.

Mr. Lindley:

(Q.) Does that Polaris fault continue to be the hanging wall of the North dipping vein below what you call the intersection of the red vein?
A. It does.

Q. Where?

A. In raises 494 and 498, which are a downward continuation of raises 7 A and—well, 5 A, say, intermediate.

Q. Are the MacNamara stopes in the West section of the mine on the Polaris fault?

A. I explained a moment ago that there is a plane of faulting on the hanging wall in the western workings of the MacNamara, but whether or not it is the same fault that we term the Polaris fault in the eastern section, I don't know.

Q. Is raise "A" on the Polaris fault?

A. I just answered that question, I think, Judge.

Q. Well, won't you kindly answer it for me again? I was talking about the stopes and I simply confine myself now to raise "A"?

A. I do not know whether it is or not, because I do not know whether this faulting in the hanging of the westerly workings is the same as in the easterly.

306 Q. Have you undertaken to trace that Polaris fault in the different sections of the mine other than where you have testified?

A. No.

Q. You have not?

A. I have not.

Q. And you do not consider that that Polaris fault was a structural feature of any value?

A. Well, it is in the hanging—it coincides practically with the hanging wall of the vein, in fact, forms the hanging wall of the vein there, and so long as you follow the vein, why——

Q. You do not know that it is the hanging wall in the west country?

A. I do not know whether the Polaris fault is, I know that there are plenty of evidences of faulting in the plane of the vein in this west territory.

Q. But you do not identify that as the Polaris fault?

A. I never have identified it.

Q. And the only place you have identified what you call the Polaris fault is in the section of these raises, 4 A, 5 A, etc.?

A. That is where we gave it its name, in this locality, and I have never tried to extend it as the Polaris fault in any direction. I did not consider it of enough importance to try to trace it out. I know perfectly well that there is a similar condition west in this vein on the plane of the hanging; similar condition of faulting.

Q. Do you know anything about a fault sometimes called the Siebert fault?

A. If it occurs in——

Q. You can answer that question categorically. Do you know a fault sometimes called the Siebert fault?

307 A. I have heard of such a fault.

Q. Can you identify it as being the same as the Polaris fault?

A. I do not know where the Siebert fault is.

Q. You never have identified it in the ground?

A. I never have.

Q. Have you read Spurr's Monograph?

A. I have looked into it a number of times; I know he refers to it but I do not recall its locality.

Q. You did not try to hunt it up?

A. No, there are too many of them.

Q. There is a difference between faults, is there not, what we call a major fault and a minor fault?

A. Referring to the amount of displacement caused by each?

Q. Well, in any way, to compare them.

A. I never have classified them that way.

Q. You never have. Well, the dynamic geologists do classify them that way; you know that, don't you? Withdraw that question. The term major and minor does involve a distinction as to importance, does it not?

A. Yes, it indicates—probably used to indicate a large displacement in one case and a relatively small one in the other.

Q. Is the Polaris fault a major or a minor fault?

A. That I do not know, because I have no way of measuring any displacement caused by it.

Q. There are several faults in the mine that do create substantial displacements, aren't there?

A. There are.

Q. Are those major or minor faults?

A. I say I have never classified them as such. I will
308 answer that there are several faults in the mine that caused quite large and more or less serious displacement.

Q. But you do not think that this Polaris fault caused any displacement, did it?

A. The Polaris fault, lying in the plane of the north vein does not interrupt the continuity of the vein; it does not fault it and cause displaced segments.

Q. Well, it is the vein, then? So far as it follows the fault it is the vein?

A. So far as it follows the fault.

Q. So far as the vein follows the fault, they are identical, the fault and the vein? Veins are all the result of faulting, are they not?

A. Well, fissuring, generally, yes.

Q. Well, that is all you can tell us about either the Siebert—You say you never identified the Siebert fault at all?

A. Never identified it underground.

Q. All you know about the Polaris fault is what you testified to, is that correct?

A. Well, I think that would cover it, Judge Lindley.

Q. You do not recognize it at all in the west section of the mine?

A. In this section of the MacNamara?

Q. Yes, the west section.

A. No, I do not.

Q. You do not correlate anything, any occurrence in the west

section of the MacNamara workings with what you call the Polaris fault?

A. You asked me if this was the Polaris fault. I said I did not know. If you want me to give my opinion, I will say I believe it to be the same plane of faulting that occurs in this segment to
309 the east of the Edwards fault. It would be perfectly natural because the Edwards fault is a fault which displaced the vein, and, therefore, a post mineral fault, and if this faulting was in evidence here, I would naturally expect it to be in evidence here (indicating.) That is all I can say in regard to that.

Q. How could it be post mineral if the vein is in it?

A. The Edwards fault.

Q. The Edwards fault is a post mineral fault. Then, your idea is that all of the yellow vein exposed on this model is in the Polaris fault?

A. Yes, in the sense that I have just described it.

Q. Does that faulting, or the hanging wall of that faulting constitute the cap rock? Is it a contact with the cap rock?

A. It reaches the cap rock.

Q. Is it the contact of the cap rock?

A. Why, no, the hanging wall of the vein is trachyte throughout a considerable extent; the fault in the hanging and the vein, you cannot mark the contact upon cap rock only where a raise is extended to reach the overlying cap rock, which might be so termed.

Q. You cannot stand for that?

A. I cannot stand for that, no.

Mr. Lindley: That is all.

Mr. Dickson:

(Q.) The Polaris fault, or the fault in the West end of the MacNamara stoping, if it be the Polaris fault, on its course upward, does it reach the cap in its upward course?

A. Yes, it does.

Q. Now, what you have designated, you engineers of the West End people, as the Polaris fault at the east end, I will ask you if
310 that is disclosed in the 400 level, where you have 461, 466?

A. Wherever we find the hanging wall——

Q. Down to the level, on this level (indicating)?

A. I know, but we find the hanging wall on this level and I was making the general statement that where we reach the hanging wall we have this fault in evidence, as it is above the level and in the raises.

Mr. Dickson: That is all.

Mr. Lindley: That is all, Mr. Chandler.

Testimony of ROBERT CHRISTIAN, who, being called and sworn as a witness on behalf of the Defendant, testified as follows, to wit:

Direct examination.

Mr. Dickson:

(Q.) What is you full name, Mr. Christian?

A. Robert Christian?
Q. What is your age, and where do you live?
A. I live here in Tonopah.
Q. You live in Tonopah?
A. Yes.
Q. What is your business, miner?
A. Yes.
Q. Were you ever foreman of the operations in the West En claim?
A. Yes.
Q. Were you foreman of the West End Company in its mining operations at the time a vein was discovered?
A. I was.
311 Q. In what shafts was that discovered?
A. McQuillan shaft.
Q. Can you point to it on this model?
A. I don't know anything about that.

Mr. Lindley: Oh, there is no question about the location of that.

Mr. Dickson:

(Q.) Do you remember what depth?
A. Between 390 and 400 feet.
Q. From the collar of the shaft?
A. Yes.
Q. And when was that discovery made, if you know?
A. It was made on the 3rd of April, 1903.

Mr. Lindley: Before final entry in the patent proceeding, it is admitted.
Mr. Dickson: You admit that?
Mr. Lindley: Yes.
Mr. Dickson: That is all I wanted to show.
Mr. Lindley: And furthermore, we admit that it is on the north dipping vein.
Mr. Dickson: That is all. We offer in evidence, in connection with the testimony of the witness, the patent for the West End Mining claim.
The Court: It will be known as Defendant's Exhibit I.

Cross-examination:

Mr. Lindley: I would like to examine the witness as to the character of this discovery.
Mr. Dickson: I was just going to ask him myself. Go
312 ahead, though.

Mr. Lindley:

(Q.) Describe the character of this discovery when you first encountered the vein in the McQuillan shaft? What kind of a vein was it?
A. It was quartz.
Q. The shaft went through it?

A. Shaft went through it.
Q. What was the width of it?
A. I think it was about 40 feet; 40 or 43 feet.
Q. What did it look like?
A. It was oxidized; oxidized quartz; I saved some. Hard quartz.
Q. At the time you encountered it, did you start a station, start to run drifts from that point, or continue the shaft on down?
A. No, coninued on down.
Q. How long before you came back to it to run the levels out?
A. Well, I can't be sure of the time; probably over a year.

Mr. Lindley: Some questions suggested to Mr. Christian which may not be proper cross examination. We may recall him a little later on another branch of the matter. I do not want to discuss matters that may not be proper cross-examination. The object of this witness was simply to show the date of the discovery?
Mr. Dickson: Yes, the fact of the discovery and the date.
Mr. Lindley: Of course, the cross examination suggested goes beyond that and I will not press it at this time.
Mr. Dickson: I would like to ask one question.

313 Redirect examination.

Mr. Dickson:

(Q.) Where you encountered the vein first——
A. What?
Q. Where the shaft first cut the vein, did the vein carry any values?
A. Yes.
Q. Do you know how much?
A. $7 is the highest assay I got.

314 Redirect examination.

Mr. Dickson:

Q. Where the fault cuts the vein did the vein carry any values?
A. Yes.
Q. Do you know how much?
A. Seven dollars was the highest assay that I got.
Q. Seven dollars?
A. Yes.

Mr. Dickson: That is all.
Mr. Lindley: I may ask the privilege of recalling Mr. Christian later. I have not inquired into this matter and if we desire you to return Mr. Christian, we will send for you.

Witness excused.

Mr. Dickson: The patent was received and marked, Mr. Clerk?
The Court: Yes, defendant's Exhibit—I.
Mr. Lindley: The title is admitted in the pleadings.

Testimony of H. R. BRADLEY, called and sworn as a witness on behalf of the defendant, testified as follows, to wit:

Direct examination.

Mr. Dickson:

Q. What is your name?
A. Harry R. Bradley.
Q. What is your age?
A. Twenty-nine.
Q. Where do you live?
A. Tonopah.
315 Q. What is your business.
A. Practical miner.
Q. How long have you been engaged in working as a miner?
A. For a period covering more than eleven years.
Q. In any of the mining Camps of Nevada?
A. I have worked in several of the Camps of Nevada.
Q. Have you worked in Tonopah?
A. I have.
Q. Were you ever in the employ of the West End Mining Company, as a miner?
A. I was not.
Q. Have you been employed by the West End mining company recently to make some examination of underground workings in the West End claim?
A. I have.
Q. And how long have you been engaged in that work?
A. Why, a little more than a month.
Q. You made a pretty thorough and careful examination of the underground workings generally?
A. Of the disputed territory I have.
Q. I do not want to prolong the testimony any longer than I have to. I understand that this witness is quite familiar with the underground workings. All I care about is to call his attention to these raises and what he found in the stopes beneath. I will ask you if you are familiar with this model Mr. Bradley?
A. Yes, I am.
Q. Well, take the raises coming up from the north dipping vein first. I will ask you if you have been up 488 raise?
A. I have.
Q. Describe what you found in it?
A. 488 raise is a raise driven in what I call the north vein quartz, following the hanging wall of the north vein up for a distance
316 of sixty feet. The hanging wall is easily traced through the entire course of the vein, and the quartz is of varying width, from three feet to about one and one half feet in the face.
Q. And from its appearance what is the quattz there in that raise, what is the vein matter in that raise, compared with the quartz and vein matter in the north dipping stopes, as you call it.
Q. The character of the quartz is the same. It is a north dipping

quartz and there is no difference in the appearance so far as I was able to see.

Q. And the quartz that you find in the raise in your judgment and opinion, was that quartz in place, or was it what you call drag?

A. It was quartz in place.

Q. You know what is meant by drag ore or drag quartz?

A. I do.

Q. Now take the next raise west of that? What is it?

A. 461.

Q. Were you up there?

A. I was.

Q. And you may state what you encountered in that from the top to the bottom?

A. The raise is approximately thirty-seven feet long, and it starts out of 461 drift, a hanging wall drift on the north vein, following the hanging wall on the north vein on the 496 to the intersection with the 411 East Drift.

Q. The raise goes up from that level?

A. The raise goes up from that level. It is in quartz all the way up and the hanging wall is disclosed throughout the entire distance; there are values in that raise.

Q. In your opinion as a miner does the material in that
317 raise anywhere disclose values observable by the eye, an ocular examination, without the test of acid.

A. There is 13 ft. up the raise.

Q. Go to 2-A please.

A. 2-A is a raise 120 feet in length.

Q. It starts in a stope or from a stope?

A. Yes, it starts from a stope and continues up over the hanging wall of what is called the south dipping vein; all in continuous quartz for a distance of eighty-five feet. There is also good ore in this raise in places, two places that I remember, one 45 feet up the raise, and the other 59 feet.

Q. Carrying values observable to the eye?

A. Remarkably observable.

Q. Now, what is this structure or dip of the quartz in the bottom of the raise, in the stope?

A. Well, of course, it has been stoped out at that point, but where it is observable in the raise it has a north dip.

Q. Any quartz remaining in the stope itself?

A. There is quartz on the other side of the stope.

Q. What is its dip?

A. North.

Q. Go to 4-A?

A. 4-A is a raise 63 feet in length; it is also driven in continuous quartz with no interruption and the hanging wall plainly visible throughout the raise. More than a foot of quartz in the face of the raise.

Q. And what is the greatest thickness of quartz that you have in that raise?

A. 4½ feet is the greatest thickness that I encountered.

Q. And does that disclose any values to the eyes?
A. It does in two places.
Q. Go to the next one—5-A.
A. 5-A is a raise also following the hanging wall, and the
318 quartz in the north vein, driven for a distance of 137 feet, which shows continuous quartz for a width of from two to five and one half feet.
Q. How far up?
A. For a distance of seventy-five feet, where it is cut off by a porphyry wall; the balance of the raise is porphyry.
Q. You do not make any distinction between the trachyte and the rhyolite; call them all porphyry.
A. Porphyry is good enough for me.
Q. 6-A?
A. 6-A is also a raise on the north vein and has a height of approximately 23 feet. The same conditions obtain in this 6-A as in 5-A, 4-A and 2-A.
Q. Quartz all the way up?
A. Quartz all the way up.
Q. 7-A?
A. 7-A is also a raise driven on a continuance of the north vein; it is very misleading,—the quartz varies. In some places it is hardly trac-able at all; approximately fourteen feet from the end of the raise I saw no quartz at all.
Q. From there on down to the bottom have you more or less quartz?
A. Yes, more or less quartz although it is interrupted. It is hard to determine it; it is not as continuous.
Q. Interrupted by what?
A. By slips and breaks and things that I don't know anything about.
Q. A north dip?
A. What there is has a north dip.
Q. Where that quartz is found there is it in place?
A. It is in place, yes, sir.
Q. And has a northerly dip?
A. It has a northerly dip.
Q. Were you in 366.
A. I have been in 366, although I have never been able to get into it from below; it is caved.
Q. You have never been up this little raise 3-B?
A. Yes, I have been up that raise.
319 Q. Been up the line connecting——
A. Yes, I have.
Q. And in 366-raise, the one there in yellow on the model, state to the court what you find there, as to dip and material.
A. I find a north dipping quartz following up to cap rock; it is cut off in its rise against the cap, and it is the same character as this quartz back here, being what is called the north dipping vein.
Q. What are you pointing to?
A. Back here on the north dipping vein.

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Q. You are back to the stopes?
A. Yes.
Q. Now did you observe this little piece of work that I now point to with my finger, colored in yellow and extended in red up to 466 raise?
A. Yes, I did.
Q. Is that run on the hanging wall, or is it simply a piece of work in the north dipping vein?
A. Well, it is a continuation of a raise—302 raise, from a drift on the south vein; showing south dipping quartz, and the raise shows the porphyry hanging wall for thirty feet, it is concealed by a scab of quartz, and is then exposed forty feet up the raise by a shaft, vertical raise exposing the porphyry hanging wall again. The porphyry hanging wall terminates against the north dipping quartz.
Q. About where?
A. About eighty or eighty-two feet up the raise.
Q. How do you get from there to 366 raise?
A. The raise straightens up into an abrupt incline, and holes into this 366 raise.
Q. Now, coming to the A-raise?
A. The hanging wall of the north vein is exposed at the end of this 302 raise.

Mr. Lindley: Your question was as to the A-raise.
320 Mr. Dickson: I know. I was just letting him finish his answer.

Q. Is that all you desire to say about that 366 raise?
A. That is all, yes.
Q. Did you find quartz in that?
A. Yes.
Q. North dipping quartz?
A. Yes, I did.
Q. Does that appear to be in place or drag?
A. It is in place, a large body in place.
Q. Now, going to the A-raise,—you have been up that I take it?
A. I have, yes.
Q. What did you encounter in that raise,—what kind of material is found in it?
A. Why you find a strong vein of quartz, not so much at the commencement of the raise, but obtaining an average width of three feet throughout the rest of the raise.
Q. How is it at the top?
A. It is two feet at the top.
Q. Quartz still in the top?
A. Quartz still in the top.
Q. What is the dip of that quartz?
A. North dipping quartz following the north dipping hanging wall from the McNamara stope up through the A-raise.
Q. Calling your attention to this portion of the model, I will call your attention — this little connection to the main model lying

east of the east end line of the West End claim, have you been out there?

A. No, I have not this is as far as I have been out here, near the Mizpah raise.

Q. Have you traced out any of these raises, in the south dipping vein?

A. All of them.

Q. Take the most easterly one, and describe what you find there as you go up, and describe what you find at the top of the
321 raise in the way of any difference in structure, if there be any?

A. 569 raise, is a raise driven up from 500-C stope.

Q. This is in what vein?

A. In the south dipping vein, following the south dipping vein up until it is cut off by a north dipping wall.

Q. And the north dipping wall—anything besides a wall?

A. Yes, there is a south dipping quartz on the south side, and a north dipping quartz on the north side.

Q. And the two come together?

A. And the two come together.

Q. The next raise in the south dipping vein westerly of the one that you have just described?

A. 571 raise is practically the same as 569, in as much as the wall cuts off—that wall ends the south vein.

Q. And the dip—is there quartz in that raise?

A. There is quartz all the way up and the porphyry hanging wall is exposed all the way, for 35 ft.

Q. And whereabouts as you follow up that raise do you encounter quartz of a northerly dip?

A. Fifty one feet up that raise; this line is the end of the south vein, and is the foot wall of the north vein. The quartz on the south vein having a south dip, and the quartz on the north vein having a northerly dip.

Q. Did you observe the angle of dip on the two walls there; did you observe it with your eye?

A. I did.

Q. Have you a recollection now of what angle of dip of the south dipping quartz is?

A. What the angle of the dip of the quartz is?

Q. Yes.

A. I should say about thirty five or thirty eight degrees.

322 Q. What would you say of the dip at the point of junction of the north dipping quartz?

A. I should say that dipped about forty one degrees.

Q. Go to the next one?

A. The next one is 573-raise. At the start of that raise you have a south vein hanging wall, a hard porphyry hanging wall, traceable continuously through 573 raise to its intersection with 411 E. D. drift, also along the intermediate connecting 573 raise and 575 raise; the intermediate is 65 feet long, and the hanging wall is exposed throughout.

Q. And the dip of those two raises, the intermediate is what,—the dip of the quartz?

A. I don't know what the dip of the quartz——

Q. I mean the direction?

A. The dip of the hanging wall is 45 degrees; the quartz has a south dip.

Q. And does either of these raises come in contact anywhere or the intermediate drift which you refer to, come in contact with the northerly dipping vein?

A. Yes, at 573 raise; the lower part of the south dipping quartz in 573 raise is cut off against a porphyry wall; that wall is six feet high. The upper part of the quartz continues on up to the intersection with 461 hanging wall drift; the quartz there is not cut off by the porphyry wall. The south dipping quartz terminates against the north dipping quartz; the line of demarcation is very plain.

Q. A change in the dip?

A. Yes, a change in the dip.

The Court:

Q. Is it a distinct line of demarcation there?

A. There is a distinct change in dip. The quartz coming up that way having a southerly dip and meets the quartz this way having a northerly dip; in that way you can see the change in
323 the dip. It is not gradual it is very abrupt.

Mr. Dickson:

Q. Go to the next. The other raise from the south dipping vein, if you follow it up to a junction with what you call the north dipping vein?

A. No, 575 raise, but it does go over to the south dipping vein; it is an old raise.

Q. Have you taken any samples of rock from any of these raises and delivered them to an assayer?

A. I have, taken several samples.

Q. Have you a list of them?

A. I have.

Q. Has anybody taken samples in connection with you?

A. There was. Mr. Hoxie also took samples.

Q. You and Mr. Hoxie took samples together?

A. Yes.

Q. Have you the result of your samples here?

A. I have.

Q. I will ask you how you took your samples?

A. We took the samples across whatever looked to us to be ore.

Q. You took samples of what appeared to you to be vein material?

A. Yes.

Q. What did you do with the samples?

A. We delivered them to the assayer.

Q. Carried them down in your hands?

A. Yes, carried them down in our hands.

Q. Did you have them designated with numbers?
A. There was a number in the sack, but he could not tell from what part they came.
Q. Each sample was delivered in a sack by itself, one sample in a sack?
A. One sample in a sack.
Q. And a number with each sample in the sack?
324 A. A number accompanied each sample in the sack.

Mr. Dickson: It is now half past four, so I presume that we had better adjourn.
Mr. Lindley: I would like to say before the adjournment is taken, that there is an understanding between counsel that at some stage during this case that the court is to be invited to accompany a representative of each side to the underground workings of the mine. Would that be agreeable to the court?
The Court: Yes, certainly.
Mr. Dickson: A representative I suppose, you mean one of the experts, Mr. Lindley?
Mr. Lindley: Yes, one of the experts. We will keep the lawyers out of this part of it.

(At this time an adjournment was taken until tomorrow morning at Ten o'clock A. M., December 11, 1914.)

325 7.

December 11th, 1914—ten o'clock a. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

H. R. BRADLEY, on the stand for further direct examination.

Mr. Dickson:

Q. Mr. Bradley, have you a list of the samples that you took in connection with Mr. Hoxie?
A. I have.
Q. Will you hand them to me please?

(Witness producing list.)

Q. The samples which you took you and Mr. Hoxie, and which you delivered to the assayer, I understand were all taken from one or the other of these regions?
A. They were.
Q. What date or dates were your samples taken.
A. December third and fourth.
Q. Can you identify the place from which each of those samples were taken?
A. I can.
Q. The list that you hand me is dated December 4, 1914, are all the samples that you took on this list?

A. They are; they are all in one list; that list was made at the office a copy of the original list.
Q. And where was your sample No. 1 taken?
A. Sample No. 1 was taken in 2-A raise.
Q. Do you know at about what point in 2-A raise?
A. Yes; it was about forty five feet up the raise.
Q. Did you make a memorandum of the width of the material that you sampled there?
A. It was approximately one foot.
326 Q. You did make a note of it?
A. I did.
Q. Where was your sample No. 2 taken?
A. Also in 2-A raise.
Q. And about at what point?
A. About 59 feet up the *faise*.
Q. And what was the width of the material that you there sampled?
A. About 14 inches.
Q. Did you take a sample in this and the preceeding instances across the entire width that was sampled?
A. Yes, just across that width.
Q. In other words you did not sample the width of the raise but sampled the entire width of the material of which you took the sample?
A. Yes, sir.
Q. Where was your sample No. 3 taken?
A. It was taken in 4-A raise.
Q. And from where if you know?
A. Well, I would have to look at that sheet.

Mr. Lindley: Well, just put the sheet in evidence Judge; if it states where it was taken and identify the number of samples. If it will shorten the thing in any way.
Mr. Dickson: It won't take much time. The sheet will not show the point in the raise where they were taken.
Mr. Lindley: Oh, I beg your pardon I thought he had to refer to the sheet to find out where they were taken.

Mr. Dickson:

Q. That was taken where, in 4-A raise?
A. About 18 feet up the raise.
Q. What was the width of the material there sampled?
A. About one foot.
Q. And No. 4 was taken where?
A. Also in four-A raise.
Q. Whereabouts in the raise?
A. Up about 34 feet in the raise.
Q. What was the width of the material that you sampled there?
327 A. That was about two feet.
Q. Where was sample No. 5 taken?
A. No. 5 sample was taken in 5-A raise.

Q. How far up?
A. 70 feet in the raise.
Q. What was the width of the material that you sampled there?
A. About eight inches.
Q. Where was sample No. 6 taken?
A. 461 raise.
Q. How far up?
A. 13 feet up in the raise.
Q. What was the width of the material sampled there?
A. It was about 10 inches.
Q. Where was your sample No. 7 taken?
A. 429 raise.
Q. Just point that out on the model?
A. (Indicating.) Right there.
Q. That is in the south dipping vein I take it?
A. In the south dipping vein.
Q. What was the width of the material sampled there?
A. Twenty inches.
Q. Where was sample No. 8 taken?
A. Also in 429 raise.
Q. At what point?
A. The 45 foot mark.
Q. That is forty five feet up the raise?
A. Forty five feet from the bottom of the raise.
Q. What was the width of material sampled?
A. About two feet.
Q. Where was sample No. 9 taken?
A. Taken in 537 intermediate.
Q. Just point to that?
A. It is out of 569 raise.
Q. What do you mean by intermediate?
A. An intermediate is development work from a raise or a stope.
Q. From what point to what point?
A. Why, it is done—it runs from 537 raise to 569 raise.
Q. Is that shown on the model?
A. It is.

328 Q. Point out about where this sample was taken No. 9?
A. That was taken about ten feet—I withdraw that—I will have to think a moment just where that was taken. That was taken approximately 70 feet from its intersection with 569 raise, just about that point there (indicating).
Q. Where was sample No. 10 taken?
A. It was taken in 571 winze, in the bottom.
Q. Where is that?
A. That is a winze driven from the foot wall of 571 raise.
Q. Foot wall of what?
A. 571 raise, the south vein.
Q. Where was the sample taken, in the north vein?
A. In the north vein, yes.
Q. And about what point was that?
A. It was taken ten feet from the end of the winze.

Q. Where was sample No. 11 taken?
A. That was taken also from 571 raise.
Q. Whereabouts?
A. Five feet from the face of the winze. I will have to make an explanation. The sample previous to this one was 571, was taken ten feet from the beginning of the winze, not from the end of the winze.
Q. No. 11 was taken where?
A. Five feet from the end of the winze in the top.
329 Q. Where was your sample No. 12 taken?
A. In 573 winze; the winze leading from the foot wall of 575 raise.
Q. And your sample No. 13?
A. Was taken from 302 raise; raise leading from 302 east drift.
Q. In what vein, the south dipping or the north dipping vein?
A. In the south dipping vein.
Q. Now, were those all the samples which you took and Mr. Hoxey?
A. Those were all the samples that we took.
Q. Did you take any from the No. 6 raise?
A. We did not.
Q. From the No. 7 raise?
A. No.
Q. 7 A raise, I should say, or 6 A raise?
A. No.
Q. Did you take any from the A raise?
A. No, we did not.

Mr. Dickson: I was in error, Mr. Lindley, when I answered your suggestion. I find that this sheet which the witness was handing me does indicate, in each instance, the width, and does indicate approximately in every*t* case quite definitely the point from which it was taken.

Q. Is the paper which you have handed me, Mr. Bradley, is that correct?
A. It is correct.
Q. Is the statement as to the width of the material?
A. It is correct.
Q. And the place from which each sample was taken?
A. It is.
Q. I see a note at the bottom here that samples 1 to 12 inclusive taken December the 3rd, and No. 13 taken December the 4th, is that correct?
330 A. That is correct.

Mr. Dickson: I ask to have this marked as an exhibit. We offer it.
Mr. Lindley: Let it be included in the reporter's notes.
Mr. Dickson: Very well.
The same was marked Exhibit "K" and was and is in the words and figures following, to wit:

The West End Consolidated Mining Company.

Daily Assay Report.

Litigation.

TONOPAH, NEVADA, Dec. 4, 1914.

Sample No.	Working place.	Width.	Gold. Ounces.	Gold. Val.	Silver. Ounces.	Silver. Val.	Total value.	Remarks.
1.	2-A Raise	1-ft.	18	3.60	21.16	10.58	14.18	Up 45 ft. in Raise.
2.	2-A Raise.....	14-in.	24	4.80	25.58	12.79	17.59	Up 59 ft. in Raise.
3.	4-A Raise	1-ft.	76	15.20	84.32	42.16	57.36	Up 18 ft. " "
4.	4-A Raise	2-ft.	20	4.00	23.30	11.65	15.65	Up 34 ft. " "
5.	5-A Raise	8-in.	12	2.40	17.15	8.58	10.98	Up 70 ft. " "
6.	461 Raise	10-in.	10	2.00	9.08	4.54	6.54	Up 13 ft. " "
7.	429 R @ 40 mark.	20-in.	36	7.20	40.42	20.21	27.41	Across Bottom & side.
8.	429 R @ 45 " .	2-ft.	36	7.20	37.04	18.52	25.72	Across top & Side.
9.	537 inter.....	1-ft.	16	3.20	17.50	8.75	11.95	70 ft. from 569 R.
10.	571 W. in bottom.	2-ft.	76	15.20	75.22	37.61	52.81	10 ft. " end S. Vn.
11.	571 W. side & top.	2-ft.	1.18	23.60	157.34	78.67	102.27	5 ft. from face of winze.
12.	573 W.....	18-in.	1.40	28.00	125.38	62.69	90.69	25 ft. from 573 R.
13.	302 Raise	2-ft.	24	4.80	25.08	12.54	17.34	Up 12' from 302 drift.

Samples 1 & 2 inclusive taken December 3rd; No. 13 taken Dec. 4th.

332 The Court: Let it be known as Defendant's Exhibit K.

Mr. Dickson:

(Q.) I think you stated yesterday, Mr. Bradley, that each sample was put in a sack by itself and with a number. Does the number of the sack correspond with the number of the sample contained in it?

A. It did.

Q. And I will ask you if each—withdraw that. Were these samples, any of them taken from rock which was not in place?

A. They were not.

Q. And what did you do with the samples after you put them in the sack with the number?

A. We kept them right with us and delivered them personally to the assayer.

Q. What was his name?

A. I don't know what his name is.

Q. Do you know whether he is an assayer for the West End Company or not?

A. He is.

Q. You do not know his name.

A. I don't know his name.

Q. You would know him when you see him, if he should come here?

A. Yes.

Q. I think you stated, Mr. Bradley, that you had spent about a month in the examination of the underground workings in these properties?

A. I did.

Q. Did you go through the works, all of the workings that were open and accessible?

A. Not all, no.

Q. Most of them?

A. No, not most of them. Just the works that had any relation to the veins in dispute at their top or apex.

333 Q. Did you follow down the south dipping vein from its juncture with the north dipping vein?

A. I did.

Q. How far down did you go?

A. Down to the 600 level, as far as I could get.

Q. At which end, or both? West end or east end?

A. On the east end of the claim, down to the 600, and on the west end of the claim down to the 500.

Q. And on the north dipping vein, how far did you follow that down at the west end—westerly end?

A. I followed it every place that I could in the West End ground, and some places in the MacNamara.

Q. Following it down from that A raise through the stopes?

—. Down from the A raise, yes.

Q. Have you, while you have been engaged in mining, have you ever occupied any other position than that of a miner?

A. Yes, I have occupied several positions in and around mines.

Q. What positions have you occupied?
A. That of foreman and shift boss.
Q. You never worked in either the MacNamara or West End?
A. Not as a miner, no.
Q. As a miner, what is your opinion, if you have one, as to what kind of a vein this south dipping vein is?
A. I would call the south dipping vein a fissure vein.
Q. And what would you call the north dipping vein?
A. I would call the north dipping vein a fissure vein also.
Q. Have you in the east end or the west end workings on the south dipping vein followed up to the junction of the two
334 veins?
A. I have.
Q. And what, in the way of fissure, did you follow up from level to level? I do not care for a description of it, but did you or did you not follow up a fissure?
A. I did; I followed up the south fissure to its intersection with the north fissure; and also followed up the north fissure to its intersection with the south fissure.
Q. From what you have observed in this month that you have been engaged in examining the undergrounds workings, have you formed an opinion as to what you, as a miner, would take as the top of the south dipping vein?
A. I have.
Q. Where do you say the top is?
A. I say that the top of the south dipping vein ends against the foot wall of the north vein.
Q. In what respects, if at all, do these two fissure veins which you have mentioned differ, the one from the other?
A. So far as I can see, they differ only in one respect, and that is—or I should say, that they are similar only in one respect, and that is in the quartz; both veins carrying practically the same kind of quartz, so far as I have been able to judge.
Q. In what respect do they differ, then?
A. They differ in their size, differ in their dip, differ in their strike, differ in their hanging wall, in the appearance of the hanging wall.
Q. You say they differ in size.
A. They do.
Q. Is that true, speaking generally, of the——
A. So far as I have observed, it is.
335 Q. As you went down from A raise, from its top down into the stopes of the MacNamara as far down as you did follow in that direction, state whether or no the hanging wall of the north dipping vein is observable, to be seen?
A. It is.
Q. And what is its appearance, the hanging wall of the north dipping vein?
A. Well, wherever it was not caved off, it is what we call a gouge hanging wall, clay seam along the hanging wall.

Q. Is that true as you go up the A raise, as well as up through the stopes?

A. It is.

Q. Is that true at the place where the south dipping vein intersects or comes in contact with the north dipping vein?

A. It is, as shown in A raise, and a place in the stope about 10 feet long, 15 feet east of A raise.

Q. Now, could that be observed by anybody who should go there to-day?

A. It can.

Q. The hanging wall of the north vein in that immediate vicinity having the clay gouge?

A. It can.

Q. And what is the appearance of the hanging wall of the south vein in the immediate vicinity of the mine at the juncture, if it be observable there?

A. It is a very hard porphyry hanging wall where it is exposed. However, part of it is concealed by quartz; in that kind of a hanging wall you have to break the hanging wall down with the quartz, you can not draw the line between the two when you are stopeing.

Q. What do you mean, you have to break the hanging wall with the quartz, is it frozen?

336 A. It is frozen to the hanging wall, yes.

Q. On the hanging wall of the south dipping vein?

A. On the south dipping vein.

Q. Can that be observed by anybody who should go there to-day?

A. It can.

Mr. Dickson: You may cross examine.

Cross-examination.

Mr. Lindley:

(Q.) How long have you been engaged in mining in Tonopah?

A. About ten months.

Q. That is including the period that you have been engaged in investigation in the West End?

A. It does.

Q. Where did you work, what other mines?

A. In the North Star Mine.

Q. Any other mine?

A. No other mine.

Q. Are the conditions in the North Star Mine anything similar to what you have here in the West End and the MacNamara?

A. No, I do not recall any two vein- meeting in the North Star.

337 Q. Well, as to the veins themselves?

A. Yes, they are all fissure veins in the North Star.

Q. Do they lie the same as these do, in the same rocks.

A. They do, only at greater depth.

Q. These are the only mines that you have worked in in Tonopah the North Star and what you have done in the West End?

A. Those are the only ones.

Q. What position did you occupy in the North Star?

A. That of shift boss.

Q. Where had you worked before you came to Tonopah?

A. I worked in Montana, Wyoming, Idaho and Utah, and different camps throughout Nevada.

Q. Were you working at the North Star at the time that you were employed by the West End Company?

A. I was.

Q. What was the task assigned to you when you were employed by the West End company?

A. To make a study of the physical facts underground.

Q. Well, I understand you to say that you have not seen all of the workings on these veins in the McNamara and West End ground?

A. Just the physical facts that related to this dispute.

Q. Well, you thought that all that was necessary was to examine the ground in the immediate neighborhood of the so-called juncture of the vein?

A. I did.

Q. And you limited your examination to that?

A. To those points, I did.

Q. You are not familiar with the major part of the workings in the entire mine.

A. I am not.

Q. Now with reference to these samples, you say that you sampled here a bit and there a few inches, and there some more of an

338 area?

A. Yes.

Q. Is that the ordinary way of sampling an upraise or drift or winze?

A. No it is not the ordinary way. Our idea was to determine whether or not there was paying values in that raise.

Q. You simply took the quartz?

A. That is all.

Q. You did not take any gangue, or anything that the miner would in the ordinary stoping of the vein?

A. We did not.

Q. Simply selected samples?

A. Simply selected samples.

Q. Of ore, quartz ore.

A. Quartz ore.

Q. Is there anything else besides quartz that you sampled?

A. There was not.

Q. Then you simply picked out here and there, not for the purpose of determining whether the body or the whole would pay, but as to whether there was pay values in spots?

A. That was the idea.

Q. There is not any difference between the quartz taken at the one south dipping side of this vein and the north dipping side of this vein?

A. Not as a whole.

Q. The quartz in this district is pretty much the same wherever you find it, isn't it?

A. Practically the same, yes sir.

Q. So you could not state if I should hand you a piece of quartz—you could not state where it came from in the camp?

A. I could not.

Q. Now, when you speak of the quartz dipping, what do you mean by quartz dipping; does the quartz dip?

A. I mean the structure of the quartz what you might call the grain of the quartz.

Q. You mean to infer from the dip of the quartz that that is the dip of the vein?

A. Well, in this case it does. The quartz in the vein dips
339 the same as the hanging wall,—parallel to the hanging wall.

Q. Well in determining the dip of a vein, you take the wall don't you?

A. Oh, yes.

Q. That is the rule?

A. That is the rule.

Q. That is the only way you have to determine the boundary of a vein?

A. Yes.

Q. You say that you have a good hanging wall in what you call this north dipping vein, do you?

A. Have a well defined hanging wall, yes.

Q. It carries gouge does it?

A. It does in every place that I have observed it, except where there is a large area—where there has a large area been stoped; in a case of that kind of course the gouge would be caved off from the wall, as it is not self supporting.

Q. In other words in mining in a drift where you have a cleavage between your ore and your wall, your ore has dropped easily, without having to break the wall?

A. It has.

Q. And where your ore is frozen to the country rock, the country rock comes down with the quartz or ore?

A. More or less of the country rock.

Q. And in that case you have no definite hanging wall, except the line of demarcation or country rock?

A. That is what I have always called the hanging wall in any country.

Q. Well, you mean by hanging wall the overlying wall, whether a selvage or clay seam or country rock; that is the hanging wall?

—. ——.

Q. That is the hanging wall?

A. Yes that is the hanging wall.

Q. Now, did you desire us to infer from your testimony that the north dipping vein has a well defined parting, a gouge hanging wall, and that the south dipping vein goes into the country rock.

340

A. Wherever I have observed it it has.

Q. There is no gouge on the hanging wall?

A. On which vein?

Q. The south dipping vein?

A. Well, I recall one place where I saw some little gouge on the hanging wall of the south dipping vein, different, however, in character from that on the north dipping vein.

Q. How about this place up in the neighborhood of Raise-A; the miner has evidently mined that as one stope, didn't he, up on the north dipping vein and down on the south dipping vein; take it to the westerly stope.

A. Well, there is some of this ore that evidently did not pay so it is in there yet.

Q. Well, I mean that that was taken out; west of the A-Raise.

A. West of the A-Raise?

Q. Yes. That evidently,—did you observe the walls in the immediate vicinity, the crest or top there?

A. I did.

Q. In both the north and south?

A. I did.

Q. You say that on the south dipping vein there is a gouge? And on the north dipping vein at that point is it frozen?

A. No. Just the reverse to that.

Q. But there is a gouge from above here?

A. There is a gouge from the north dipping wall, and frozen quartz on the south dipping wall.

Q. In other words you pass by a definite line of overlying hanging wall into gouge to the north dipping vein in a zone that has no frozen country rock?

A. Wherever the hanging wall is broken, you do.

Q. Well, what do you mean by that?

341

A. Well, evidently when they mined this, when they took out this ore, they didn't try to find out just what was their true hanging wall; in other words, put up a row of holes to break that down.

Q. Your idea is that the real hanging wall of the south dipping vein is higher than shown on the model?

A. No, the hanging wall of the north dipping vein is higher.

Q. And the gouge is not exposed in there?

A. It is at A-Raise, and back to a point fifteen feet west of A-Raise where a slab is broken off.

Q. In the extreme west end of that stope there is a wall exposed in the north dipping vein?

A. There is.

Q. What is it?

A. A gouge hanging.

Q. When speaking of west of A-Raise. You are pointing to the east. Have you been talking of the east of the raise?

A. With regard to the hanging wall being broken.

Q. I have been talking of west of the A-Raise. Let us straighten ourselves out. I am speaking about the condition of the stopes west of the A-Raise. Is there any difference in the hanging wall in the south dipping and north dipping vein in that locality?

A. Not that I recall.

Q. Is it a gouge hanging wall?

A. It is a gouge hanging wall.

Q. How is it in the south dipping?

A. It is a hard porphyry hanging wall wherever it is exposed.

Q. In other words there is a difference right at that point between the hanging wall of the two veins?

A. There is further down but right at the point where they intersect is more or less frozen quartz. It has not been stripped off so that you can tell.

Q. To tell whether you have a hanging wall above it or not?

A. You could not.

342 Q. Now in those raises that we call the A-raises down here, in the east section of the country, you say that you have a good hanging wall there?

A. We have.

Q. What does it consist of?

A. Wherever it is caved out it is gouge, or a clay seam.

Q. And if you did not have a gouge you would not have a wall; you would not have a hanging wall there. You consider that if you did not have the gouge there that that would not have a wall?

A. Yes; it is caved there in places; the line of wall is still plain along the side of the raise.

Q. What is the bottom of the upraise in?

A. Porphyry.

Q. In other words you have a foot wall of porphyry?

A. A foot wall of porphyry, yes sir.

Q. Frozen?

A. Yes, frozen,—the quartz is frozen to the porphyry.

Q. Well do you know how far down that quartz extends?

A. Not in every case, no.

Q. In any case?

A. Yes, I do in this vertical raise.

Q. I am speaking about—which vertical raise?

A. That holes into 5-A.

Q. Well, I was not speaking about,—tell us what you found in that vertical raise?

A. Vertical raise holeing into 5-A raise shows 17 ft. of porphyry between the hanging wall, of the south vein, and the foot wall of the north vein, as shown in 5-A raise.

Q. That is between the foot wall of the raise above and the red vein below?

A. Yes. The hanging wall of the red vein below.

Q. You say that foot wall in that raise is frozen?

A. It is in places; in places it has been dug out.

343 Q. Now, I suppose you have studied this model pretty closely, haven't you?

A. I have.

Q. Anybody tell you what the things are that it stood for, and what they meant?

A. Well, they would hardly need to tell me.

Q. Well, answer my question, please.

A. Not that I recall, no.

Q. Haven't had any discussion with Mr. Wiley or Mr. Winchell, or Mr. Chandler about these different exposures in different raises?

A. Why, I have asked what the coloring meant, yes.

Q. And you testify now with the reference to the colorint and your description is taken, is it not, from the coloring on this model?

A. No, my description is taken from the rocks on the ground.

Q. How would you know where they terminated on the model unless it was colored?

A. By scaling it off as to height.

Q. Have you scaled it off since you have been on the stand here?

A. No, not since I have been on the stand.

Q. Then, in connection with your work, you have studied very closely the model, haven't you?

A. I have.

Q. Did I understand you to say you were working for the North Star Company at the time you were employed in this case?

A. I was.

Q. You did not make any of the work in this mine, did you, as a miner?

A. I did not.

344 Q. And you do not know who made them?

A. No, I do not.

Q. You were called, then, as a practical expert rather than as a man who had made the works as a miner?

A. I was.

Q. You knew, I suppose, at the time you came that these upraises had not been made by the miner in the prosecution of the ordinary work in the mine, did you not?

A. I didn't know anything about the condition underground when I was employed by the West End.

Q. Well, I mean after you got in and found out what the condition was. You knew that this was litigation work, didn't you, and not ordinary mining work?

A. Yes.

Mr. Lindley: That is all.

Redirect examination.

Mr. Dickson:

(Q.) I wish that you would indicate a little more definitely, Mr. Bradley, the place where in the MacNamara common stope, near the

West End, where you say that there is ore remaining there which is of too low a grade, apparently, to take out, was not stoped?

A. About 30 or 35 feet east of A raise.

Q. On which, the north dipping or south dipping vein?

A. On both veins.

Mr. Dickson: That is all.

345 Recross-examination.

Mr. Lindley:

(Q.) I would like to ask Mr. Bradley another question or two. Do you determine with reference to this ore that you say is in place, that it did not have values enough to stope, do you determine that fact from the fact that the ore is there, or from looking at the ore?

A. From both.

Q. Do you pretend to say that you can go in that mine and look at a stope and tell whether it will pay without sampling?

A. No, I could not tell whether it would pay or not, but I could see whether there was any considerable amount of sulphides, or what is called rhodonite in it.

Q. Well, the fact is that the ore was there and you concluded from that, from the stopes in that immediate vicinity that they did not stope out because it did not pay?

A. That was my conclusion.

Mr. Lindley: That is what I though-. That is all.

Mr. Dickson: That is all; call Mr. Hoxey.

Testimony of BEN. I. HOXEY, who, being called and duly sworn as a witness on behalf of the Defendant, testified as follows, to wit:

346 Direct examination.

Mr. Dickson:

(Q.) What is your full name, Mr. Hoxey?

A. Ben Irving Hoxey.

Q. What is your age?

A. 42.

Q. Where do you live?

A. I reside in Tonopah at present.

Q. How long have you lived in Tonopah?

A. Why, the better part of eight years.

Q. What is your business?

A. Miner.

Q. How long have you been a miner?

A. Well, I have been for twenty years.

Q. And how long have you worked as a miner in Tonopah?

A. Well, I have been mining here for about a little over seven years.

Q. Have you ever held any position with the mines in Tonopah other than that as a miner?

A. I have.
Q. What position?
A. Well, I was foreman of the MacNamara.
Q. For what mines have you worked chiefly in Tonopah?
A. Well, I have worked in the MacNamara a great deal, and I have worked in the Belmont and the Buckeye, and the West Tonopah.
Q. Were you ever employed as a miner or shift boss or foreman or in any other capacity by the West End Company?
A. Not with the West End Company.
Q. Have you been employed by the West End Company recently?
A. I have.
Q. To do what?
—. To study the physicial facts underground in certain
347 places of the mine in regard to this litigation.
Q. How much time have you spent in that examination?
A. Since the 9th day of November.
Q. Daily?
A. Every day.
Q. You are familiar with this model?
A. T- a greater or less extent, yes.
Q. What is colored in red at the east end of the model, how far, to what depth have you been down there in your examination?
A. On the red color?
Q. Yes?
A. Why, I have been down as far as the 600 level in the West End Claim.
Q. The West End. You mean the west end claim, which do you mean, the 600 level at the east end of the claim, or the west end of the claim?
A. On the east end of the claim.
Q. Been up and down there more than once?
A. I have.
Q. Did you always as you went up and down follow the same line of travel, or have you been up and down from the top or junction to the 600 level in different places in the east end?
A. Well, I have been down there in two ways. That is, two different routes down through the stope.
Q. And at what is colored in red to represent the south dipping vein, near the West end of the claim, for what depth have you been down on that portion?
A. I have been down as low as the 500 level.
Q. That is in the course of your examination?
A. Yes.
Q. A number of times, or once only?
348 A. I was down through that way twice.
Q. Have you worked as foreman of the MacNamara mine for a considerable period?
A. I did.
Q. Were you foreman when the MacNamara Company mined

this portion of the vein which is shown in yellow on this model, most of it?

A. Why, the greater part of it, yes.

Q. How far to the west on what is colored yellow, or what we call the north dipping vein was stoped under your supervision or while you were foreman?

A. Why, there was a little work done, I believe, up in this section, in the extreme western section.

Q. You are pointing westerly of A raise?

A. Yes, sir. There was a little ore extracted there after I had left that company, but this ore here, the most of it was extracted under my immediate supervision.

Q. You say here; what do you mean?

A. In the stope leading in a northerly direction from A raise.

Q. Down how far? As far as shown on the model, or farther?

A. That I extracted?

Q. Extracted while you were foreman?

A. Yes sir, as far down as is shown on this model.

Q. In your examination since the 9th of November, I will ask you if you have made a careful examination of the raises shown upon this model as the 488, 2ZA, 4A, 5A, 6A, 7A, -A and 302?

A. I have.

Q. And 366?

A. I have.

Q. I wish you would start at raise 488, Mr. Hoxey, and tell
349 the Court what you found, what is disclosed in that raise, in the way of quartz or vein material, or walls, or whatever you may have to say about it?

A. Well, 488 is driven upon and follows the hanging wall of a north dipping vein. The vein in 488 varies in size. Now, where the raise commences in 411 East drift the vein — quite extensive there. In fact, there is vein in both sides of the raise, and vein on the top of the raise and vein the bottom. As you continue up on the dip of the vein, the vein gets somewhat smaller, although it continues through to the face of the raise.

Q. On the floor of the raise or at the roof of the raise?

A. No, not on the floor of the raise and not in the roof, but at a point midway between the two.

Q. Now, what have you there at the top of the raise?

A. The top of the raise?

Q. Yes?

A. Well, you have the vein in place. You have wall rock under the vein, and you have wall rock over the vein in the face of that raise.

Q. What do you call vein, quartz there?

A. Quartz.

Q. And what showing of quartz in there at the top of the raise?

A. Why, the showing of quartz at the top of that raise is very weak; in fact, is a very few inches, probably not over three or four inches of quartz in the immediate face of the raise.

Q. And does it gradually increase in width and thickness from there on down to the bottom?

A. It does.

Q. Is that quartz which you find there, in your judgment, in place, or has it been dragged there from some other source?

350 A. No sir, in my judgment it is vein in place.

Q. Go to——

A. That is 461 raise, that one that you indicate.

Q. 461; were you up that?

A. I was.

Q. State what you find there?

A. 461 raise is driven on and follows the hanging wall throughout.

Q. Hanging wall of what?

A. A north dipping vein. The quartz showing on 461 is very strong for nearly the entire distance.

Q. What do you mean by very strong?

A. That is, there is a continual vein of quartz.

Q. How thick?

A. Well, it will vary probably from 2 to 3 feet.

Q. And what have you in the top of the raise?

A. In the top of the raise immediately under the hanging wall of the raise, why, nearly all the formation is porphyry with a mixture of quartz.

Q. You *made* go to 2 A raise and described what you observed in that?

A. 2 A raise is driven from an old stope in a southerly direction. It is driven——

Q. You mean the stope is in a southerly direction? No, you are right. Go ahead.

A. The raise is driven on and follows the hanging wall throughout of a north dipping vein. The raise is of a length of about 137 feet. No, about 120 feet, that raise.

Q. Did you measure it?

A. Why, yes, I measured it. And those distances, of

351 course, I have them in my notes; sometimes they are confusing.

Q. You have your notes with you?

A. Yes sir; if I remember rightly, that is about 120 feet.

Q. And what is disclosed in that raise?

A. Well, that raise shows a quartz vein up the raise continuously for about 75 or 80 feet. The vein, what I say continuously, is that it is a solid continuous vein of quartz up to that distance.

Q. And above that what have you?

A. Above that, although you have the same hanging wall, the showing of quartz is more or less weak. That is, the formation has a greater part of porphyry with a mixture of quartz throughout.

Q. Near the top?

A. Near the top, yes.

Q. And is that also, in your judgment, the quartz that is disclosed there in place?

A. It is in place.

Q. Go to 4 A.

A. 4 A is a raise that is driven from an old stope in a southerly direction. It is driven on and follows the hanging wall for the entire distance of a north dipping vein. This raise shows quartz throughout, clear to the face of the raise.

Q. Clear to the top?

A. Yes, sir.

Q. About what is the dimension, thickness?

A. About—oh, it would vary from a foot and half or two to six feet.

Q. To 6 feet?

A. Yes sir, in places.

Q. Practically the full width of the raise in places?

352 A. Yes, sir.

Q. Is that in place, also, in your judgment?

A. It is.

Q. Go to 5 A.

A. 5 A is a raise that is also driven from an old stope, in fact the same stope.

Q. And the 4 A and the 2 A?

A. As the 4 A and the 2 A. It is driven also in a southerly direction and follows the hanging wall of and on a north dipping vein. This raise shows quartz continuously for about 75 feet.

Q. Then what do you encounter?

A. Why, you encounter a condition where the material immediately under the hanging wall is mostly porphyry, with a small quartz showing in places.

Q. And what are the dimensions of the quartz in that raise up for that 45 feet, if that were the distance?

A. Why, 75 feet, Judge. Pardon me.

Q. What size is the quartz, how thick?

A. Oh, the vein will vary from 2½ to 5 feet.

Q. Go to 6 A?

A. 6 A is a raise driven from an old stope, in fact the same stope that 2 A, 4 A, 5 A, is driven from, and it is driven upon and follows the north dipping vein the entire distance. It is rather a short raise, being only about 23 feet in length.

Q. And what have you in the top of it?

A. Why, this raise shows quartz the entire length of the raise.

Q. Go to 7 A?

A. 7 A is a raise driven from the upper end of the same stope from which these other raises have been driven, and it is—the

353 length of this raise is about 34 feet, and it is driven upon a hanging wall and follows a north dipping vein for the entire length of the raise.

Q. What do you find in it?

A. In 7 A the quartz showing is considerably weaker than in the others. In fact, after you get up the raise, say, oh, probably 12 or 15 feet the showing of quartz is very weak from there in the face. While you can find little bunches of quartz throughout the length

of the raise, why, the formation of that part that should be the vein is mostly porphyry. There is more or less faulting has occurred at the commencement of this raise, and the showing up there is pretty weak.

Q. Now, take 366 raise. Is any portion of that in a vein?

A. A vein?

Q. Any portion of that raise?

A. Why, 366 raise, what I seen of 366 raise was in a vein. The raise is caved at the bottom and you could not get up the raise, so the way I got into the raise was to go up 302 raise which holes through into the bottom of 366 raise, up 366 raise probably half way up the raise.

Q. And when you got into the 366 raise by that route, what was observable there?

A. Why, there was—the raise is all in quartz except that portion which shows the hanging wall over head.

Q. For some distance from the top where it connects with the 200 level?

A. Well, way up near the top of the raise, why, the vein disappears and is replaced by country rock.

Q. Go to A raise. Were you up that?

354 A. I was.

Q. State what you observed there?

A. A raise in the western part of the MacNamara Mine is driven upward in a southerly direction from the top of an old stope. This raise is driven up about 45 feet on a north dipping vein, following the hanging wall the entire distance.

Q. What is observable in it, apart from the hanging wall? What is the material in that raise?

A. The raise follows a vein nearly the entire distance, or—well, the entire distance I would say. It is a very strong quartz showing, nearly the entire length of the raise. The quartz showing right in the top of the raise being a little weak.

Q. And does it or not increase in thickness or width as you go down from the top to the bottom of the raise?

A. Yes, the vein increases in size as you go from the top to the bottom.

Q. Did you, in company with Mr. Bradley, who was just upon the stand, take any samples?

A. Yes sir.

Q. Did you take any from the A raise?

A. No sir.

Q. Why not?

A. Why, I suppose for the same reason that we did not—in other parts, that we did not see anything there that we considered worth while sampling.

Q. Do you think it was barren quartz?

A. Well, no, I don't think it was barren quartz?

Q. Did you think it was low grade quartz?

A. Yes, I did think it was low grade quartz.

Q. What kind of samples were you endeavoring to get as you——

A. Why, we were just endeavoring to procure samples
355 that would show value.

Q. What do you mean by values?

A. Commercial values.

Q. Commercial values?

A. Yes sir.

Q. And did you take any samples, either by yourself or in connection with Mr. Bradley from the 7 A raise?

A. I did not.

356 Q. Was your failure to do so due to the explanation which you have given with reference to A-raise?

A. It was.

Q. You were looking for sample*d* which in your judgment would show commercial values?

A. I was.

Q. Did you take any other samples except those which were taken by you with Mr. Bardley?

A. No, sir.

Q. You heard his testimony?

A. I did.

Q. About those samples?

A. Yes, sir.

Q. The surface from which each sample was taken?

A. I did.

Q. And without going over that again with you in detail, would his testimony in that regard coincide with your observation?

A. Yes; I believe that his testimony is absolutely correct on that point.

Q. Did any of the samples which you and he took—I will ask you if any of the samples which you and he took were taken from rock, that you did not in your opinion believe to be rock in place?

A. Every one of those samples, in my belief was taken from rock in place.

Q. I will ask you if in A-Raise you found any ore or quartz which was like in appearance to the ore and quartz which you found in the McNamara stope northerly from that A-Raise while you were working in the McNamara employment?

A. Do I understand the question: If I found no ore in A-Raise similar to the ore——

Q. Yes.

A. Why, yes, I did.

Q. Is there any peculiarity to the ore?

A. Yes, there is a peculiarity about that particular ore.

Q. What was the peculiarity?

A. Well, there was a character of ore there throughout that part of the country, down through the McNamara and also observable in A-Raise, known to the miners as a rhodonite ore.

357 Q. Have you a sample of the ore?

A. I have.

Q. Just show that to the court and point out anything that is peculiar?

A. Now this ore some of the miners——

Mr. Lindley: Better identify that if you want to put it in evidence. The record won't show what it is.

Mr. Dickson: I will have to identify it.

The Witness: This ore—I will have to explain is recognized by the miners as a rhodonite ore, and others call it a pink manganese owing to the pink color, owing to the construction of the rock, but those are two names commonly known to the miners; rhodonite and pink manganese; owing to that pink manganese being har- to get around we had better call it rhodonite ore.

Q. Where was this sample taken?

A. This sample was taken from the McNamara mine.

Q. Recently by you?

A. It was.

Q. Did you find similar ore in the A-Raise?

A. I did.

Q. How extensively did this ore occur in the McNamara stope?

A. Why, that same character of ore was very noticeable in all the McNamara stopes from which came commercial ore or high grade ore.

Q. Is there a mark on that so that it can be identified? Mark it with your name, "H"?

A. Probably I can do it with a colored pencil.

Q. All right.

(Witness marking exhibit.) "H-1."

Q. You have marked it H-1?

A. "H-1."

Mr. Dickson: I offer that in evidence, if the court please.

Q. Did you find that same kind or ore in any other of
358 these raises that you have been testifying about?

A. I did.

Q. Which one or ones?

A. I found the same character of ore in raise designated A-4.

Q. About how far up the raise?

A. Well, the exact number of feet I do not remember. Something like forty or fifty feet.

Q. Did you take a sample of it for assay or not?

A. I don't remember if there was a sample taken across that particular spot for assay or not.

Q. Did you leave any of it there?

A. Yes, there is a large bunch of it, quite a little body of it.

Q. And is that true also of A-Raise, any ore left there?

A. There is not as much of it in A-Raise as in 4-A.

Q. Is there any left in it now?

A. In 4-A?

Q. No, in A?

A. There was when I was there, yes.

Q. Now did you go up any of the raises on what we call the south dipping vein?

A. I did.

Q. Starting at the most easterly one, describe to the court what you observed in it, giving it- number.

A. The most easterly raise in the West End territory, is designated here as 569 raise; that raise commences from the old stope, I think it is called 500-C.

Q. You think that the stope is?

A. Yes; and the raise continues upward on the dip of the vein for a distance of about seventy five feet. At this point the quartz or the vein in 569 raise terminates against the north dipping wall of quartz.

Q. Go to the next one?

A. 571 raise commences from the same 500-C stope and continues upward for perhaps 50 feet, when the vein in the raise terminates against another north dipping wall of quartz.

359 Q. Go ahead to the next one?

A. 573 commences from 500-C stope, and continues upward on the dip of the vein; the vein continues up until it reaches 561 drift where it terminates against a north dipping wall of quartz.

Q. Well, the next one?

A. 575 is in the south dipping vein the whole distance.

Q. Opened up into a red stope?

A. Opened up into a drift not a stope.

Q. Did you say that last raise that you spoke of connected with the 561?

A. It is south dipping quartz——

Q. What drift does it connect with?

A. 405-drift.

Q. Now these samples that you took in connection with the samples that you took with Mr. Bradley, what did you do with them?

A. Those samples were taken by us and kept in our possession constantly from the moment they were taken until the moment they were delivered into the hands of the Assayer.

Q. From your experience as a miner and from your examination of the underground workings in the mines here involved, how would you classify, or what would you call this north dipping vein, or the vein having a southerly dip?

A. I would call the south dipping vein a Fissure vein.

Q. As you went up from the bottom to the top, or down from the top to the lowest workings, that you were in on the south Fissure vein, you may state whether the fissure was observable?

A. Well, following down on the dip of the vein we followed the same vein continuously from top to bottom, without leaving that vein and going into any other vein.

Q. Well, were you in a fissure—did you follow down a fissure?

A. Yes.

Q. And what kind of a vein would you call the north dipping vein?

A. I would call the north dipping vein a fissure vein also.

360 Q. What in your opinion Mr. Hoxey, as a miner, with the knowledge and observation that you have been able to make, of this south dipping vein, would you call the top of that vein?

A. What would you call the top of the vein?

Q. Yes.

A. I would call it the apex of the vein.

Q. Well, but where, whereabouts in your judgment would you define the top of the south dipping vein?

A. Because the vein in its——

Q. Oh, no, you do not hear the question. Where do you find it?

A. Against the foot wall of the north dipping vein.

Q. Where it intersects or comes in contact with the south dipping vein?

A. Where it comes in contact with the south dipping vein.

Q. That is what is in your judgment the top of the south dipping vein?

A. It is.

Q. Are you from your observations while the work of stoping was going on in the McNamara, and while you were foreman, able to tell the court anything about the hanging wall of that north dipping vein what its appearance is?

A. Yes. Through nearly all of the workings of the north dipping vein of the McNamara we have a nice full gouge hanging.

Q. Have you made an examination of the territory in the immediate vicinity of Raise-A?

A. I have.

Q. And where you have a north dipping and south dipping structure?

A. I have.

Q. I wish you would describe to the court what is the appearance in that place, at that line of junction, of the hanging wall of the south dipping vein?

A. Well, the hanging wall of the south dipping vein is what a miner knows as a frozen hanging wall. The quartz is frozen to the country rock immediately overlying the vein in *in* such a

361 manner, that if you want to take all the quartz down you will have to take a little of the hanging wall, or if you want to leave the hanging in place, you will have to leave some of the quartz there.

Q. And what is the appearance of the hanging wall on the north dipping vein, at that line of juncture?

A. The north dipping vein at that point is through a nice smoothe hanging wall with a gouged condition between the ore and the hanging wall.

Q. What differences, if any, are there between the north dipping vein and the south dipping vein?

A. Why there is numerous differences including the differences in the hanging walls of the two veins, the veins are different in their dip and there is a difference in their strike, and they are even, as far as I can see, different in the extent of their ore.

Q. In what?

A. In the size of the ore bodies found in both veins.

Q. Was the McNamara stope, out near this west end—that stope in which A-Raise is now found, continued while you were foreman there, until you got to the boundary line between the two properties, the West End and the McNamara?

A. It was.

Q. State what, if any, difference there was in the values, thickness or size of the ore, as you passed from that portion of the stope which had a north dip to that portion which had a south dip?

A. Why, as we stoped up on this north dipping, vein, we had a very rich stope in this section, or most of it, in fact there was very good ore; it was very high grade ore in a commercial way at that time, and when we came to the place where the stope started down,——

Q. Southerly?

A. In a southerly direction in the south vein—why the ore along there lost its value; that is it lost its value in comparison to
362 what we had, on the slope of the north dipping vein.

Q. How noticeable, how broad was the change in value?

A. Well, the ore taken out in the north dipping vein, was a very good grade of commercial ore at that time, while the ore in the south dipping vein was of very poor value; it was very disappointing in value.

Q. Was it shipping ore?

A. There was a small portion there that we took out for shipping, yes.

Q. And in the north dipping vein was it shipping ore up to the place of contact with the south dipping part of the stope?

A. It was.

Q. While you were foreman of the McNamara—when did you cease being foreman?

A. Why, I ceased being foreman in May, 1910.

Q. At the time that you were foreman of the McNamara did you know of any break in this roll, in which we find this common stope down at the West End?

A. No, sir.

Q. What did you consider it to be then? That feature of it?

A. Well, the only thing to consider, was the natural conclusion that it was a roll.

Q. That is what you believed it was at that time?

A. Yes.

Q. And the roll, the crest of the roll, you know what we mean by that—while you were foreman there, I will say before 1909, had it been disclosed anywhere else except at this westerly portion?

A. Had the crest of the roll been disclosed anywhere else?

Q. Yes.

A. Not to my knowledge, no sir.

(At this time an adjournment was taken until two o'clock P. M. December 11th, 1914.)

363 December 11th, 1914—two o'clock p. m.

The Court: The Jim Butler Tonopah Mining Company, vs. the West End Consolidated Mining Company.

B. I. HOXEY on the stand for further direct examination.

Mr. Dickson.

Q. You may proceed with the cross examination, Judge Lindley.

Cross-examination.

Mr. Lindley:

Q. I understood you to say Mr. Hoxey that at one time you had been the foreman of the McNamara Mining Company?

A. I was.

Q. Was you the foreman at the time that Mr. Chandler was superintendent?

A. I was part of the time; I went there as foreman after he had assumed charge as manager.

Q. That was about the time that the McNamara Company was in trouble with its neighbor?

A. Well, I believe that the litigation had started in December of 1906, and I went there in March 1907.

Q. Do you refer to the West End litigation of the Extention litigation?

A. The West End McNamara litigation.

Q. 1906?

A. Yes, sir.

Q. As early as that?

A. Well, the mine was tied up in litigation when I went there in '07, in March.

364 Q. Well, then, you went there at approximately about the time of the litigation?

A. I was there during that time.

Q. And you knew what the West End had to meet in that case did you?

A. Yes.

Q. And you felt at that time, as I understand your testimony, that this was one vein that rolled over from a north to a south dip?

A. That was my belief, yes, sir.

Q. But you have changed that belief?

A. Well, certain development work upon the north dipping vein has changed my belief, and a careful study of the situation.

Q. Well, the conditions existing at that time necessitated a rather close study didn't it?

A. It did.

Q. And you as an employee of the McNamara did your best to find out what the truth was?

A. I certainly did.

Q. And it was your conviction that there was but one vein that rolled from the north to the south vein?

A. Yes, sir.

Q. That was your understand- up to what time?

A. Until I inspected the property here in the month of November 1913.

Q. Where were you employed at the time you undertook this investigation? for the West End people?

A. I was down in Nevada City.

Q. You were in Nevada City?

A. Yes, sir.

Q. Not in this town at all?

A. No, sir, I had been in this camp until about three weeks before being in the employ of the West End Company, when I went to California and I returned from Nevada City, after an absence of about three weeks.

Q. Now, at about the time of this old controversy between
365 West End and McMamara, were any of these series of raises that you have testified to, run?

A. Not to my knowledge.

Q. Calling your attention to what you have identified as raise 5-A, had that been run?

A. Not to my knowledge, I did not know anything about that raise at all.

Q. Did you hear Mr. Chandler's testimony?

A. I did.

Q. You heard him state that it had been run?

A. Yes.

Q. But you did not know anything about it?

A. No, sir, I did not know that that raise was in existence at all.

Q. You were foreman of the mine?

A. I was, of the McNamara.

Q. Of the McNamara?

A. Yes.

Q. Cooperating with Mr. Chandler and the balance of us in developing the suit at that time?

A. Yes.

Q. There is nothing in 5-A different from what there is in the other raises?

A. Why, practically not. The only difference as I stated in my direct testimony, is a condition that exists in 4-A, different from the rest of those raises.

Q. To that extent you say that there is a difference?

A. Yes.

Q. That difference is not very marked Mr. Hoxey?

A. Well, no.

Q. When you were stoping this stope at the extreme west end of the McNamara workings in the neighborhood of stope -A where you say that you stoped the ore from the north to the south dipping vein, that stope was all made at one time or progressively made, and folded over to the north dipping vein.

A. There was a portion of it made at that one time.

Q. Well, you did not recognize anything more than what
366 you concluded at that time to be the same vein, was a roll?
A. Yes, the same vein.
Q. The ore that was taken out of those stopes how was that ore treated?
A. How was the ore treated?
Q. Yes.
A. At that time it was treated by smelter, hand sorted.
Q. Hand sorted?
A. It was.
Q. Did you separate in the separating process the ore that came from the north from that which came from the south dipping vein?
A. Did we separate it,—from what?
Q. From itself?
A. Why every bit of that ore was sorted in the ore bins.
Q. It was all sorted together as it came into the ore bins?
A. Yes, all sorted together.
Q. All stoped at the same time?
A. No.
Q. Well, I mean, as a continuous process?
A. As a continuous process it was all stoped at the same time up to a point which you call the crest.
Q. Was it all stoped out until you reached the west end line?
A. No, sir.
Q. What happened when you got to the crest?
A. Well, when we got to the crest we realized that we could not mine this ore as cheaply by shoveling it up hill and over the crest as we could if we had an upraise from underneath, so the ore could be immediately shoveled into a chute as it was broken.
Q. On that part of what you considered to be one vein at that time, you carried on underhand stoping?
A. You would, if you stoped this ore in the south dipping
367 vein, over this opening in here.
Q. How was that ore extracted; was it extracted continuously or did you put up an upraise and stope from that side?
A. We stoped all the ore that showed the desired value up to this crest, and when we seen that ore was going over, we continued stoping here, and in the meantime we went down into the McNamara on the 200 level and run a cross cut in until we reached the line, and then we made an upraise at that point, if I remember, that was just within the McNamara side lines, parallel to the side line, and we held through, and intersected the south dipping vein, the foot wall of the vein with that upraise.
Q. So that the stope was worked in both directions?
A. It was worked in both directions.
Q. Do you recall a particular drift and upraise that was run by the West End company along in the neighborhood of that stope?
A. I do.
Q. What did you used to call it in the old McNamara days?
368 A. Why, it is as near as I can remember; I don't remember just exactly what they did call that.

Mr. Dickson: What the MacNamara people used to call it, I object to as irrelevant, and immaterial.

Mr. Lindley: Well, what the witness used to call it.

Mr. Dickson: The question was what the MacaNamara people used to call it.

Mr. Lindley: Well, he was the MacNamara people. I withdraw the question and reframe it at the suggestion of my friend, Judge Dickson.

Q. What did you call it, Mr. Hoxey?

A. Why, just what the name of that was I don't recall, but we knew it as the side line litigation work.

Q. Side line litigation work?

A. Yes, sir, that is about the only thing that I can recognize it by.

Q. You thought they were hunting for an apex in that, didn't you?

A. Yes, sir.

Q. You examined that upraise in that drift as it went in?

A. I did.

Q. Pretty carefully?

A. I did.

Mr. Dickson: What raise is that, Mr. Lindley? Will you have it designated?

Mr. Lindley: I think you have it marked here.

The Witness: 152 raise, and this raise down here up to this level is 258 raise. 258 raise and 152 raise and the drift connecting the two.

Mr. Lindley:

(Q.) You examined that pretty carefully as it went on, didn't you?

A. I did.

Q. Well, practically you were examining -verything that
369 the West End people did there, were you not?

A. Why, yes I went through the works occasionally and see what new works they was opening up and what they was doing in their old works.

Q. You were getting ready for a law suit?

A. Yes sir.

Q. Now, you do not connect that present drift now with any of the recent workings, say, raise A, for instance? Has that got anything to do with what is shown in raise A?

A. I believe not.

Q. You believe not?

A. No.

Q. You said there was a gouge overlying the north dipping vein?

A. I did.

Q. When did that gouge occur prominently?

A. Well, that gouge occurs most prominently between the quartz and the overlying country rock.

Q. As a blanket overlying all of this stoped ore?

A. It does.

Q. Do you find that gouge running out at all from the vein into any faults or into any cross cuts that you have or drifts running away from the vein in the hanging wall?

A. No, not that I remember of. I don't beliebe that I ever did observe such a condition.

Q. That gouge that you speak of, then, you are sure is not local at a certain point in the stopes in the west MacaNamara workings?

A. No sir, the same condition can be perceived in the eastern working just the same as the western working.

Q. Then, you describe these veins, you state that two veins, that is, according to your later revelations and later investigations,
370 that the north dipping vein has a character-stic difference from the south dipping vein in that it has a gouge hanging wall?

A. Yes sir.

Q. And that the south dipping vein has not?

A. Yes sir.

Q. That is correct, is it?

A. It is.

Q. That is true of all the observed parts on both the north and south dipping veins, as far as you have seen them?

A. As far as I have seen them.

Q. Well now, with reference to this rhodonite ore, is that what you call it?

A. Yes sir.

Q. Who invented that name for it, do you know?

A. Why no, I do not, but I know it is commonly known among the miners as rhodonite or pink manganese ore.

Q. Well, that is owing to its pink color, I suppose?

A. Pink color and I suppose some of the ingredients of the ore which they constructed into those names for some reason or other.

Q. Well, you want us to understand, then, that another essential difference between these two veins is that in the north dipping vein, including the upraises, the theories of what we call the A upraises carries rhodonite ore, and there is none found in the south dipping vein?

A. No; no sir, I did not testify to that fact at all.

Mr. Dickson: All I asked him was if he found that same rhodonite ore, whatever he called it, in two of those upraises that he found in——

Mr. Lindley: Yes, you studiously avoided asking him anything about the south dipping vein. I am asking him if he wants
371 to leave that impression. I noticed that you did not ask him if that same occurred in the south dipping vein. I ask him if he wants to leave us with the impression that that was a distinctive feature. It certainly left me with that impression.

Mr. Dickson: Go ahead.

Mr. Lindley:

(Q.) How is it about that rhodonite ore, why do you utilize that

as a distinctive feature of this north dipping vein if it occurs in the south dipping vein?

A. Is that a question?

Q. Yes sir.

Q. Why, I did not quite catch it.

Q. Read it please, Miss Reporter.

(The reporter read the question.)

A. Why, I did not know as I used it in a distinctive feature.

Q. Well, it does occur in the south dipping vein?

A. It does occur in the south dipping vein in places, so I am told, but there is one feature that I can remark about that rhodonite ore, that when we were stopeing in the MacNamara down here, for a space of several hundred feet, that the rhodonite ore was always accompanied by the high grade ore in the stopes that we extracted. That is, that we never did find any high grade ore to any great extent but what there was more or less of this rhodonite ore, and you can always find it, in fact, it seems to be an indication of this ore, but at the same time you can find it in veins that carry not very much value. In fact, it is not commercial ore. And about this south dipping vein, I have been down through there and I have seen stope after stope that carries none of this rhodonite ore what-
372 ever.

Q. Did you make a special investigation to determine whether it carried any rhodonite ore or not?

A. I did.

Q. What is your conclusion?

A. My conclusion was that the south dipping vein does not carry that rhodonite ore in proportion that the north dipping vein does.

Q. To what extent did you make a search in the south dipping vein for this occurrence of rhodonite ore? Withdraw that question for a moment. Did you make any distinct investigation in the south dipping vein with reference to the occurrence of this rhodonite ore?

A. Why, I didn't make no special search, no.

Q. Well, you did not have in your mind, then, the characterization of the north dipping vein as a separate vein simply because it carried the rhodonite ore?

A. Not simply, no not for that exact reason.

Q. And if it should be found indiscriminately throughout the south dipping vein, it would not be a distinctive characteristic of the north dipping?

A. I didn't catch the question.

Q. Read it please.

(The reporter read the question.)

A. That it would not be a characteristic?

Q. Read the question again. I have asked it once and if he can not understand it, why, I am sorry. Perhaps I am a little diffuse in my statement of the question.

(The reporter read the question.)

373 Mr. Lindley:

(Q.) Now, if you can not answer, Mr. Hoxie, I do not want you to answer anything you can not answer.

A. I can not answer that intelligently, Judge.

Mr. Lindley: All right. I will excuse you if that is your explanation, you say you can not answer it. Take the witness.

Redirect examination.

Mr. Dickson:

(Q.) Do you wish to be understood as saying that in your judgment there is none of this pink manganese ore, called by that name, in the south dipping vein, or that you have not observed it?

A. I did not say that there was none of it, there.

Q. I understand that you have been informed that there is plenty of it, the same character of ore in the south dipping vein?

A. Yes, I understand that the same does exist in quantities in that vein.

Q. When was it that you ceased to be foreman of the MacNamara mine, if you can give us the date?

A. Why, I ceased to be foreman there in May, 1910.

Q. Now, during that period, while you were foreman there, after the litigation between the MacNamara Company and the West End Company had been terminated, did your duties carry you into the West End workings after that litigation was settled?

A. Why, no, not until the present time.

Q. After you ceased to be foreman and prior to last month
374 when you were employed to make this examination, had you been through the underground workings of the West End?

A. I had not.

Q. You were called attention to the 2 raises that had been made while you were foreman of the MacNamara, raises made, however, by the West End Company, 158 and 252?

A. 258 and 152.

Q. 258 and 152?

A. Yes.

Q. I see 152. Where is 258?

A. That is 152.

Q. Yes; now where is 258?

A. Here is 258 here. That is the first raise that comes off the 200 level and connects this drift here with 152 raise.

Q. I will ask you whether you know that those raises, either or both of them are in the hanging wall country of both veins?

A. Why, no, I don't know.

Q. You do not know about that. Let me call your attention to 152 raise. What color is that?

A. 152 is green color.

Mr. Lindley: Now, Mr. Dickson, I submit the witness is testifying

and he ought not to have his attention called to the colors indicating——

Mr. Dickson: I am not going to ask him what that green color represents. Simply for the identification on the record. He don't know, as I understand. I am not trying to help the witness and always try to refrain from doing so. I think it is improper.

Mr. Lindley: I believe you do generally, I agree with you.

375 Mr. Dickson:

(Q.) When the upraise that you described to Mr. Lindley that you had made for the purpose of avoiding underhand stopeing, and through which you have a chute there to take down the ore from the south dipping vein, do you remember that distinctly?

A. I do.

Q. What was done with that? How were you treating the ore at that time, smelting?

A. We were sending to the smelter.

Q. When you broke down that ore from the south dipping vein over the crest of the roll, you started south and went down to the line, what was done with it?

A. There was a small portion of it sent to the ore house of the first ore that was broken. But by continual assaying it and sampling, we found that there was no profit in that little stope in there, and there was a great quantity of that ore that was left in place when I ceased to be foreman there.

Q. Well, you were foreman. Do you know why it was left in place while you were foreman?

Mr. Lindley: I suppose it may be conceded that owing to the conditions in the camp at that time, it could not be shipped at a profit.

Mr. Dickson: That is all I wanted to show. That is all. Now, Mr. Lindley, acting upon the suggestion that you kindly made this morning, I had the assayer, Mr. Bowman make a certificate of the result of his ass-y of the samples that had been delivered to him by Mr. Bradley and Mr. Hoxie.

Mr. Lindley: I have agreed with Judge Dickson to accept
376 the assayer's certificate.

Mr. Dickson: As the correct results, correct assay?

Mr. Lindley: Yes.

The Court: It may be known as Defendant's exhibit L.

Mr. Dickson: Call Mr. Winchell.

Testimony of HORACE V. WINCHELL, who, being called and sworn as a witness on behalf of the Defendant, testified as follows, to wit:

Direct examination.

Mr. Dickson:

(Q.) What is your full name, Mr. Winchell?

A. Horace V. Winchell.

Q. And what is your age?

A. Forty-nine.

Q. Where do you reside?
A. Minneapolis, Minnesota.
Q. What is your profession?
A. That of a mining geologist.
Q. Where did you study your profession?
A. I began my studies at the University of Minnesota. Perhaps I should say that before going into the University I grew up in a geological atmosphere.
377 Q. How is that?
A. Before going to the University I grew in a geological atmosphere.

Mr. Lindell: I want to extend to Mr. Winchell the same complement that I have to the others. I accept his qualifications.

Mr. Dickson:

Q. What is the geological atmosphere that you refer to?
A. My father was a geologist and I was when a small boy taken by him into the field in geological investigations, so that I heard geological matters discussed from the time when I was able to understand it. I graduated at the University of Michigan, where I studied chiefly with my Uncle, another geologist of some note.
Q. What is his name—Alexander Winchell.
A. Alexander Winchell.
Q. Was he a Professor in the University of Michigan? A geologist?
A. He was.
Q. When did you graduate there?
A. In 1889.
Q. Now, how continuously since then Mr. Winchell have you followed your profession of Mining Geologist and Engineer?
A. I have engaged in the study of Geological conditions, investigation of mines, constantly for the past twenty-five years.
Q. Will you state—I do not mean to go into great detail with it, but in a quite general way the different countries in which you have been called upon—state-, territories and other countries to make examination of mines for the past twenty-five years, and what your object was in making those investigations. Whether it was simply a s-ientific investigation for your own satisfaction, or whether
378 you were employed by people to make examinations and report upon mining districts for them.
A. For about three years after graduation I was engaged in geological survey work in connection with the investigation of the Iron ores and somewhat of the copper formations of the Lake Superior region; I then went into the employ of mining companies making geological investigations of properties and taking charge of the exploration for Iron mines. At that time I made the first report upon these Mesabi Iron range in Minnesota, which has since become famous as the greatest Iron district in the world. From that my field of work extended to the western part of the United States, and I engaged in general examination work, the investigation of mines, as to their

value, the geological structure, and in connection with various mining enterprises examined mines in all of the states of the west, I think, without exception, as well as in the Lake Superior region, Canada, in Alaska, in Mexico, in Sweden and in South America.

Q. You have been actively engaged for the past twenty-five years in the practice and pursuit of your profession?

A. Yes.

Q. Have you during that time at intervals been employed in the direction of mining operations on properties?

A. As consulting geologist directing the development of the mines, I have; I have not had the executive management of properties.

Q. Well, in that capacity give us the names of the principal mines you were so connected with?

A. My principal employment in that connection has been in Butte; I resided in Butte for eight years between 1898 and
379 1906, and during that time was in charge of the various — of the geological department of the various mining companies, associated or affiliated with the Amalgamated Copper Company—advising in the development of the mines. I have also been engaged in similar work in the Cœur d'Alenes in Idaho, and in other districts some in Colorado and in Utah.

Q. You have made an examination of the properties involved in this controversy?

A. I have; I have spent perhaps five weeks in the study of the conditions underground.

Q. Was that examination so made by you for the purpose of ascertaining the character of veins that were encountered in this country, their course, strike, direction, dip and top or apices of them?

A. It was.

Q. And have you reached a conclusion as to the course, direction or strike of the veins, encountered here, and as to the dip of the respective veins and the apices of the veins if there be more than one?

A. I have.

Q. I wish now Mr. Winchell, without further interrogation, you would take up the result of your observations and explain to the court what observations you made and then, in conclusion what your opinion is; use whatever will best illustrate what you wish to convey to the mind of the court, the cross sections of the mine wherever it will better aid you.

A. The mines of the West End and Jim Butler companies, are upon quartz veins which are found in volcanic rock. The volcanic rocks occur in a series overlying each other. They were either poured out as lava in flows, or injected into each other as intrusoins, or blown out of the crater of volcanoes as ejectamenta and fell upon the surface of the ground accumulating in considerable thickness. These rocks are what the geologist- call rocks of medium acidity, that is, they are not extremely siliciceous, nor are they noticeably poor in
380 silica. It is important in this case however, to state that all of the rocks found in these mines contain more than fifty per cent of silica, and some of them contain as high as seventy-five per cent. The oldest, or lowest, I should say,—the lowest forma-

tion which I have observed in the West End territory is that of a rock which has been called West End Rhyolite, this rock is colored brown upon the model, and the cross sections exhibited in this case. Lying above this rhyolite is a rock which has been called in the testimony heretofore, trachyte; trachyte has also been termed "altered andesite." In the veins chiefly occurring above the trachyte is found the andesite, and intruded into the andesite or abutting against it, or lying upon it in the western portion of the West End territory is what is known as the Brougher Mountain dacite breccia. The trachyte is colored violet or purple upon the model and the sections; the andesite is colored light green, and the dacite breccia, dark green. Now, althou*hg* that is the order in which these rocks occur, from the lower horizon as to the surface, it may not be the order in which they entered this district. There are some indications, although I am not satisfied sufficient to call it conclusive evidence, that the West End Rhyolite entered the trachyte as an intrusion instead of having been deposited before the trachyte. These rocks suffered the vicissitudes of a complex geological history. The trachyte was evidently, at some time, shattered by internal movement, and from it emerged or emanated solutions carrying silica; it is a well known fact that all lavas, all magmas, as they are termed by geologists, upon cooling emit large quantities of steam, which steam when it becomes sufficiently cooled becomes water, and these waters of a high temperature dissolve from the rocks and carry into the lines of easy percolation minerals, chiefly silica, and there deposit this silica; the rocks,
381 therefore, that we find before the formation of either of those veins was started are silicified. Large *Large* masses, irregular masses, (but with a general north and south trend and a vertical or easterly dip) of quartz were deposited in the trachyte, and to a certain extent in the rhyolite, before the veins were formed. The rocks themselves were mineralized by silica very extensively; the original mass of the andesite which has now been altered to trachyte, as it is called, was penetrated through and through by silica, so that the rocks as we find them to-day are more silicified than at the time of their first deposition. The next important event was the formation of the West End main vein—the south dipping vein. This vein is a fissure vein, which has been followed by replacement or substitution. Now, by a fissure vein I do not mean a vein which occupies what was once a wide open crack in the earth, the text book conception of a fissure vein is the ideal conception; it is one which is seldom found exemplified in nature, particularly where the dip is low. It is easy to understand how a vertical crack in the rock might remain open for a limited,—to a limited width, to a considerable depth, and be filled by quartz, but it is inconceivable that a vein of low inclination should be formed in an open cavity, or open space, because the strength of the rock arches, which might be imagined to exist there is insufficient to maintain the open channels. The familiar class-room illustration may be represented by this paper. If a fissure is formed by a spreading apart of the rocks, it is seldom a perfectly plane fracture. If, then, one side moves in relation to the other we have shoulder abutting against shoulder and intervening

spaces, which accounts for the pinches and swells often found in the veins. In this case there was no open fissure, of large dimen-
382 sions, there was rather a plane of shattering, along which, and in its upward course water rose, replacing the fragments of rock, and depositing quartz. It must be remembered that some of this rock was already silicified; it was not unaltered andesite; the vein was deposited or formed, thereafter sometimes with silicious rock, amounting even to quartz upon one or the other wall, and qiartz therefore sometimes constitutes the country rock of the south vein, as well as of the north dipping vein, of which I will now speak.

383 Slightly subsequent to the formation of the south dipping vein was formed the north dipping vein. This vein followed a line of fracture like the south dipping vein. It probably was accompanied by considerable faulting movement. It passed across and interrupted the south dipping vein on its course. There may have been and probably was an upper segment of the south dipping vein which has since disappeared by erosion, and if it exists at all remains in the form of a small stub of a vein in that portion of the trachyte which overlies the north dipping vein and extending upward for a fewᵂ feet to the andesite cap.

The evidences of the later formation of this north dipping vein are to be found, first, in the fact that the north dipping vein extends up above its intersection with, or meeting point with the south dipping vein. There are several workings in the ground which I will mentione later which prove beyond question the continuity of the north dipping vein upward to the south above and beyond the south dipping vein.

The next evidence of later origin of the north dipping vein is the fact that it is much less important than the south dipping vein. It is a smaller vein, it contains less ore; it is not so thick, and furthermore, it has not so completely replaced and silicified the rock material that was formed by its movement. The south dipping vein is a completely silicified vein. There is very little gouge or selvage above it. When it was formed first as a fissure, it was substantially full of rock which rock has been changed into quartz—completely changed. The north dipping vein is a fissure
384 which, likewise, contains quartz, but the country rock which was within its limits or within the reach of its solutions, has not been so completely changed into quartz. There was later a movement along the north dipping vein——

Mr. Lindley:

(Q.) May I ask a question at this juncture?

A. Certainly.

Q. When you say the formation of the vein, do you include its mineralization?

A. Yes, I should speak of the two, perhaps separately, the fissure first and the vein afterwards.

Q. You have used the formation of the fissure, and then the vein,

and I wanted to know what you included so I might follow you as you went along.

A. When I say the formation of the vein I do not refer alone to the formation of the fissure, but to the whole process of formation of the vein.

Q. Of mineralization?

A. Yes sir. Beginning with the formation of the fissure and including its subsequent filling.

There was later a movement which had a singular effect and which is beautifully registered in the ground. This movement was to the east along the plane of the north dipping vein. It was not solely on top of it. There was a movement of the ground and the vein itself. There was probably greater movement between the vein and the hanging wall rock than there was in the vein, but they both moved. This movement is recorded in the ground at the points of meeting of the south dipping vein and the north dipping vein. I can represent by my two hands——

Mr. Dickson:

(Q.) You mean the meeting in the upper course, or on
385 their onward course?

A. Both, wherever they meet. The north dipping vein overlying the south dipping has moved easterly (indicating) and the result has been that where the south dipping vein was a solid body of quartz, not completely shattered, it has acted as a knife edge, cutting into the north dipping vein so that in places we find the quartz of the south dipping vein projecting into the north dipping vein within 18 inches or 2 feet of its hanging wall; a very interesting and unusual occurrence. First the north dipping vein overlies the south dipping vein. Then, a movement along the line of intersection towards the east caused the south dipping vein to cut into the quartz of the north dipping vein, so that at that precise point there is less thickness in some cases over the upper edge of the south dipping vein than there is above and below it in the north dipping vein. It must be kept in mind that there was a great deal of erosion, probably before the andesite covered this country. This erosion probably accomplished two results: it swept away in all probability a portion of the upward extension of the north dipping vein south of the line of intersection with the south dipping vein, and it also removed the greater portion of the faulted segment of the south dipping *b*vein above the north dipping vein. How far the north dipping vein originally extended to the south, there is no means of telling, because in some of the raises we have already reached the cap rock, and it is not far distant from any of them at their upward termination. After this cap rock was deposited over the surface of the ground, came a still later volcanic disturbance, which we now find represented
386 in Mount Brougher. That mountain consists largely of volcanic breccia. That is to say, it is made up of fragments of lava which were blown into the air, and which fell back again upon the ground and which are mingled with fragments of rock and

through which the volcano emerged, exploded. We have in that breccia fragments of quartz, fragments of trachyte, fragments of andesite. We know it was a violent eruption which destroyed and obliterated the westward extension of the veins.

Coming now to a description—if you have no particular question?

Q. No.

A. Of the facts observed in the ground. My attention was first directed to this ground in April, 1914. At that time, raises 488, 2 A, 5 A, 6 A, and 7 A had been extended upward upon a north dipping vein for a considerable distance above the line of meeting with a south dipping vein. Some of those raises have been extended further since that time. At the east end of the West End claim there are stopes of considerable dimensions upon the south dipping vein.

These stopes have been connected by upraises with the 400 level of the West End Mine.

Raise 569 is the easternmost of these raises. This raise shows a large vein of quartz, dipping to the south at an angle of perhaps 35 degrees, it becomes flatter at greater depth, coming up towards the north until it meets a north dipping footwall plane of a vein. This plane is marked—I should say the angle was something like 45 degrees to the north—this plane is marked by a band of breccia,
387 crushed quartz, by a layer of dark quartz and a band of white quartz, above which we have a large north dipping vein.

I should say, perhaps, that I believe that the mineralizing solutions which came along the plane of the north dipping fissure introduced additional silica or quartz into the rock in the immediate vicinity of, and beneath the south dipping vein. There was a double period of quartz deposition caused by the two veins in the immediate vicinity of their juxtaposition. It is a fact of common observance that when two veins approach each other on strike or dip, no matter whether they actually come together or not, the intervening country rock is liable to be shattered and filled with more quartz than is found at an equal distance away from either one of the veins alone.

Here we find a larger amount of quartz immediately around the line or the point of meeting of these two veins than we have found in the rock generally, and the rock generally contains a good deal of quartz.

The raise 569, together with raise 571, which is about 25 feet to the west, and presents similar conditions, illustrates to my mind precisely the conditions which might be expected where two veins of divergent strikes and dips approach each other and actually come together. Under the conditions of such intense sili-fication as I found here, it is not surprising, even, that the territory in the immediate vicinity of the two veins should be completely changed into quartz, and there should be an appearance of a fusion of the two. When we take into consideration, however, the fact that the south dipping vein has a strike of about North 70 degrees east, and the north
388 dipping vein has a strike of about north 40 degrees west, and realize that those veins dip in opposite directions, the reason for my conclusions, which I will announce shortly, become more apparent.

Raise 573, likewise, follows up from a stope upon a south dipping vein, pursuing this vein to its meeting point with a north dipping vein.

Raise 461, just above this south dipping vein, discloses the vein dipping in the opposite direction. Beneath raise 461 and north of the upper termination or continuation of 573 we have a considerable body of quartz in which there is no structure visible indicating a dip. It has some of the quartz which presumably was deposited at the later period of sili-fication to which I assign the north dipping vein. It should be stated that in this quartz, which lies beneath the actual line of the metting of these two veins, there is much less banding, less structural evidence than in the veins themselves. The north dipping vein has perfectly beautiful banding of the mineralization, dark quartz and light quartz, silver mineral iron pyrites, etc. within its walls and near its hanging wall.

But beneath in this considerable mass of quartz which is found beneath the line of meeting of the two, no such structure is observable.

Raise 2 A—I think I will refer first to raise 488. Raise 488, which as I said, was made at the time of my first examination last April—at least in part—is followed upward to the south upon a north dipping vein until it reaches the cap rock.

389 Another fact is frequently observed in these apex raises on the north dipping vein, and that is a diminution of the thickness of the quartz as you approach the cap. To my mind, this is referable to the fact that solutions coming up along the plane of the north dipping vein, when they reached the shattered country in the vicinity of the south dipping vein and its walls, were dissipated and scattered and lost some of their hydrostatic force, or the force which would cause them to rise, and consequently less quartz was deposited above the south dipping vein than is frequently found in the north dipping vein below that point.

In raise 488 the quartz diminishes toward the top.

In raise 2 A which clearly shows a north dipping vein of from 2 feet to a few inches in thickness, we observe the same general tendency to narrow as we approach the cap rock, or as we increase the distance away from the line of the meeting of the two veins.

Raise 4 A has been driven upward to the south, parallel with 2 A and 5 A upon the same north dipping vein, but it discloses a little greater amount of quartz, better mineralization, some good ore. There is 4½ feet of stopeing ore in that raise 40 or 50 feet above the top of the south dipping vein. It is over the lower end of raise 2 A that some of the beautiful grooves caused by the eastward movement of which I spoke are to be noticed. They are seen in the hanging wall of the vein and they are observable in the quartz itself.

Mr. Dickson:

(Q.) Just what place is that? I want to make a note of it.

A. At the foot of raise 2 A.

390 Q. Where?

A. Above the foot of raise 2 A. Similar grooves may be

observed in the other raises where the ground has been removed so as to make such observation possible, but there is a splendid example of it right at this point.

Raise 5 A follows the north dipping vein for a distance of perhaps 60 or 75 feet, disclosing the structural features, the hanging wall and the thickness of the vein as I have already described in raise 4 A, with some good ore. And referring to the hanging wall, suggests another point. The hanging wall of both veins is, in general, according to my observation discernible. They are not veins without hanging walls. The parting between the quartz of the south vein and the overhanging country rock, is, however, not marked by a selvage or gouge. This wall sometimes is broken into in stoping operations. The quartz does not always come off free, but ordinarily I can see the wall, what I take to be the wall, and below it replacement sili-fication extending to greater or less distances into the foot wall country. But on the north vein we have a very perfect hanging wall gouge, a selvage of clay, tough, bendable, dark colored clay. This is one of the indications that sili-fication has not proceeded to such an extent in the north vein as in the south vein.

Raise 6 A continued upward upon the north dipping vein is very close to raise 5 A. It shows quartz throughout its extent which is about 20 or 25 feet, and is one of the additional little evidences of the overlying of the south vein by the north vein.

391 Raise 7 A is at the upper end of a long raise called 494, which follows the vein for most—the north dipping vein for most of its distance to the south from 411 west drift. At this point there has been a great deal of shattering. The vein material has not the same banded continuous structure that it exhibits in 2 A, 4 A, 5 A, and 6 A. There is quartz and a hanging wall going up this raise, but it is an illustration of the greater disturbances which have taken place throughout this country a little further to the west.

Q. Where is that disturbed country from 7 A westerly, how far?

A. For perhaps 400 feet there is a gap in the developments. Workings which have been made upon the 400 level and above it in this vicinity have, almost in every case, encountered a disturbed country. It has been impossible to follow the vein for any considerable distance without running into faults. And I should remark there are a great many faults in this mine. The chief fault, or what appears to be such, is called the Edwards fault, and is marked in blue and its course is north easterly, and its dip south easterly at a high angle. It is found along 501 drift for a considerable distance, and it is found in other workings. There are in this camp faults of very great displacement, and a great many faults of lesser displacement.

These faults might be termed major and minor faults. By major fault meaning a fault which disturbs the formations to a considerable distance, bringing blocks of one up opposite blocks of higher, what were originally higher formations. Within these different blocks, there are minor faults. So far as I have

392 observed, the West End and Jim Butler mines, that is, the territory represented upon this model, certainly west of a cross cut upon the 500 level of the Tonopah Mining Company about 150 feet east of the east end line of the West End claim is all within one block and contains no major faults. The faults which I have observed in this ground have not by me been correlated with any of the major faults recognized in the camp. These displacements are, apparently, of limited extent, and are possibly sympathetic with some of the larger fractures, but in themselves do not account for any great displacement of the vein. Along the Edwards fault, the south dipping vein has been strung out, stretched a little, dislocated somewhat, and yet the vein can be followed continuously from the stopes in the western part of the mine easterly to a connection with the stopes in the eastern portion of the mine.

—. ——.

393 A. In the vicinity of the West End shaft.

Mr. Lindley:

Q. There are several shafts on the West end.

A. What is marked upon the model "West End shaft" so called by us, there is the McQuillan shaft, the Porcupine shaft, and the West End shaft.

Q. The shaft that you now speak of, the West End shaft, that is also identified as the Corkell shaft.

A. That I do not know. I have heard the name Corkell shaft.

Q. There are three shafts, the West End the McQuillan and the Corkell. You are now speaking of the West End, so we will agree upon it and understand that when you say the West End you mean what we understand to be the Corkell shaft.

Mr. Dickson: I do not know, Mr. Chandler can tell you.

Mr. Chandler: That is it.

Mr. Lindley: Very well, the Corkell shaft and the West End shaft are agreed to be the same.

A. We have again entered, going westward a less disturbed portion of the ground, and between raise 7-A and the West End or Corkell shaft, the disturbance is so great, and in the West End shaft the cap rock comes down to such a low point that it seems possible that in that space the disturbance of which I have spoken may have left the ground in such a condition that it was easily eroded and that the veins at that point, the north dipping and south dipping veins do not approach to a juxtaposition or contact between their upper edges, that there might have been developments made which would have carried these veins, each of these veins to an independent top underneath this cap; this is strongly sug-
394 gested by the disturbed conditions of this territory but the development has not proven it. As we go towards the west, the upper plane of the surface, which was there before the cap rock came, ascends, in other words we rise towards the west under the cap. We have here in this territory the south dipping vein ex-

tending upward above the 200 level, we also find here a connection with the north dipping vein in a stope; this stope presents the appearance of a dome; the miners in taking out the ore followed continuously in what order I do not know,—but from one *slope* to the other from south to north or from north to south, and if that exposure alone had been taken into consideration and without the knowledge of any overlapping, without the knowledge of the continuation of the vein, with its structure, and the north dipping vein lying against the south—it would have been impossible to predicate such a condition there from these stopes alone; it would appear that there was an continuous connection upon the unbroken vein from a north dip to a south dip, however, raise-A has been made, following a hanging wall of the north dipping vein upward upon a poor variety of quartz, since the solution which deposited the ore apparently failed to reach that particular part of the vein; and by the way, that is nothing unusual in this district; you will see large gaps in the stopes, which does not mean that there is not any vein there, but which mean that it did not generally pay to take it out, and in its general character of impoverishment, did not pay.

Q. These frequent openings or open spaces in the stopes, both the red and yellow stopes, do I understand that those are quartz material or pillars not removed?

A. Yes; they mark the places where the ground now stands, the wooden construction in the model representing the voids or
395 openings, and I believe that it is reasonable to assume that the pillar remains because it was not rich enough to extract.

As we continue further to the west we come to the area which is occupied by the volcano. The quartz of the south vein, like that of the north vein terminates abruptly against volcanic braccia.

Mr. Lindley:

Q. What particular region are you discussing at that point?

A. I said that towards the west this vein terminated against this volcano. In the Porcupine shaft region—but the stopes show for themselves approximately, and the green color shows on the small raises in the stopes where the breccia has been observed and can be observed today. In the ground to the east of the West End claim,——

Mr. Dickson:

Q. Mr. Winchell, before you leave the West End,—I interrupted you with a question—you started in to say something about A-Raise and you did not go back to it. Have you anything to add to that?

A. I think I described it as merely representing a portion of the north dipping vein, which has not been well mineralized and which is more broken and brecciated than any other portion of it.

The hanging wall shows in that raise going up to the south, above the south dipping vein, clear to its uppermost termination.

In the workings of the Tonopah Mining Company, as I believe

them to be, lying to the east of the east end line of the West End claim, we have two vein- there, which are represented approximately in their relation to each other, therefore I believe can be correlated with the south dipping, or main south dipping or main West
396 End vein, and the north dipping vein found in the west end ground. We have a stope which is now being extended upon the south dipping vein above the 500-level.

Mr. Dickson: You had better put a mark on that so that the record will show what place you are referring to.

A. Well, that is the Tonopah Mining stope the only one that there is on the map.

Mr. Dickson: Yes, there are some places on this that we had not time to number. It won't do any harm to mark it.

A. I have marked the stope "T-Co." Tonopah company; this stope that is now being extended is in a south dipping vein similar in its appearance and character of mineralization to the main West End vein, from this stope a raise has been extended upward to the 400-level; this raise passes through the hanging wall country rock and exhibits, at or near its top a small north dipping vein,—thirty feet further north another north dipping vein, sixty feet or seventy five feet still further north a strong north dipping vein which is now being stoped. This north dipping vein has been followed upward by a raise,—it appears on this model to be about sixty-five feet in height; I had an idea it was higher.

Q. Work is going on there extensively?

A. Work was in progress there a few days ago at the time of my examination. I believe that one of these veins certainly corresponds to and represents the eastward extension of the north dipping vein in the west end ground; from their relation to each other, it can be seen that if the raise and stope upon the north dipping vein extend in their present——

[Page 397 of manuscript omitted in original transcript.]

398 "T-Co." is a part of the same vein in which the most easterly Red stopeings, east of the east end line of the West End claim, is shown upon the model.

A. I have.

Q. What is it?

A. I believe that it represents a portion of the same vein.

(At — time a recess was declared until three forty-five p. m. December 11th, 1914.)

399 The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Mr. Dickson:

Q. You may proceed Mr. Winchell.

A. The north vein is seen upon the 400 level of the West End mine, very near the east end line of the claim. The point where the

apex of this vein crosses the east end line is not absolutely determined. Raise 488 however is about ten feet west of this line.

Q. West of the east end line?

A. West of the east end line of the claim, and the actual point of crossing of the apex beneath the cap is about one hundred and forty feet—one hundred and thirty or forty feet northerly of the southeast corner of the West End claim.

The north vein upon its course to the west crosses the north side line of the West End claim. This point also is not precisely located by any workings, but connecting up exposures and known points we find the apex of the north dipping vein crosses the north side line of the West End claim about eleven hundred and twenty feet westerly from the northeast corner of the claim, along the north side line.

Mr. Lindley:

Q. Is that particular point designated by any number on the model?

A. There is no such point on the model. It is in space. So it cannot be designated.

Q. You have a yellow indication there at that point?

A. Not precisely, there is no working there at that point. The model only represents——

Mr. Dickson: Let us get at it this way: Show us the point, the first point where you know that the apex of the vein is over the north side line?

A. Raise-A passes upward on its course from the Mc-
400 Namara stope southerly across the north side line of the claim.

Q. Now, where next easterly of that do you know that it is within the West End claim, for a certainty? If we had a triangle here we could fix it.

A. It is to be observed near the top of a raise connecting the 200 level of the McNamara with the 150 raise within the West End territory.

Q. Between that point and——

A. Between those two points the line of apex crosses the line.

Q. And according to your calculation it would be about 1,120 feet?

A. About 1,120 feet, westerly from the northeast corner of the claim.

Q. Proceed with your testimony Mr. Winchell.

A. In this ground there is a third vein developed by workings in the Jim Butler and in the West End, which has some importance here because of its geological relations. It is called the Fraction vein. The Fraction vein is a vein in general parallel upon its strike and dip with the south or West End veins. The dip of the Fraction vein is steeper than that of the West End vein, and they unite upon their dip. I say that, without having an absolutely continuous connection I have seen what I believe to be the Fraction vein at the actual point of junction in the winze, but a raise is now being constructed to con-

nect them. And I have also seen in drift 422 W, the Fraction vein upon its strike.

Q. Now where is that drift? Is that a drift of considerable dimensions?

A. That is a long drift.

Q. About where is that drift? In its most westerly course?

A. Within a few feet of a junction upon strike with the West End or south dipping vein.

401 Q. The main vein?

A. The main vein. The actual point of union is obscured by a little wedge of cap rock which comes lower than the drift at that point. I have no reason to doubt and do not doubt that if this drift had been ten feet lower, the Fraction vein would have shown continuously to a union on strike with the main West End vein.

Mr. Lindley:

Q. On what level is that?

A. That is on the four hundred level of the West End mine. This vein is important because it is entirely in Trachyte. I have described the main north dipping vein and the south vein, the West End main vein, as fissure veins. I say this because, in addition to the reasons which I gave these veins pass through on their course a homogeneous volcanic rock namely, the trachyte. Wherever a line of fracture through the rocks coincides with reasonableness, reasonable approximateness to some other fracture already existing or some other contact already existing this fracture will naturally break across to such plane of contact or other fracture, and so far as possible follow it. But if in its course——

Mr. Dickson:

Q. Why?

A. Because it follows the line of least resistance and naturally takes in the weakest points in breaking the rocks. But if at any point for a considerable distance the vein has actually followed a fracture in a homogeneous rock along which there has been some movement and crushing, I consider it a fissure vein, regardless of the fact that it at some point pursues a plane of contact or a pre-existing fissure.

Q. The Fraction vein being a spur of the main West End vein lies entirely within this body of trachyte; although at some points on its course the main vein pursues the plane of contact between the trachyte and what has been termed the West End rhyolite, it

402 is also true that the south or main West End vein itself, throughout a considerable portion of this territory has for its country rock upon the hanging and foot wall both, the rock which I have called trachyte, as shown upon this model, and as shown upon the sections.

The Fraction vein then unites upon dip and upon strike with the main West End vein; and so far as developed, has above and below it, the same kind of rock.

There is another fact of importance in this connection: Where

the Fraction vein approaches the main West End vein, the intervening wedge of rock has been considerably shattered, and into that wedge of rock the solutions which originally or at one time pursued their course upward along the main West End vein, and the Fraction vein likewise, entered this shattered wedge and there deposited quartz. And we have in that broken wedge some intervening silicification; some small stopes and a good deal of quartz like that which has been found in the north dipping vein above the line of meeting with the south dipping vein. This quartz is in some instances visibly and apparently similar to the ore in the main veins and the ore in the main veins frequently carries the manganese silicate rhodonite, which has been referred to, and the stopes show that kind of ore. Beneath the point of meeting of the north dipping and the south dipping vein the mass of quartz which I have referred to and which is almost structureless although some time showing a north and south direction and vertical dip, is so solid and so massive that workings could be made upon it in any direction.

Q. You are speaking now of the body of quartz found at places between the two veins near their juncture?

403 A. Yes, sir. Workings have been made upon this quartz in various directions. There are horizontal levels; there are curved out domes, made with all the care and precision of an architect's drawing, connecting the south dipping vein with the north dipping vein by a working through this underlying mass of quartz, which, in my mind owes its origin in the first place to the general silicification of the country rock along north and south fractures; in the second place, to the additional quartz deposited in the south dipping vein and in the third place, to the quartz deposited along the north dipping vein.

That body of quartz is quite noticeable in some long workings connecting the north dipping vein with the south dipping vein, but as I say, such workings could be made in any direction and still follow quartz.

I think, perhaps, Judge Dickson, I have answered your question.

Q. Do you wish to say anything about the south branch of the main south dipping vein near the West End?

A. There is a vein, or a spur of a vein, which overlies the large stopes in the western part of the West End mine. This vein unites on its downward course with the main West End vein. Upon its upward course it terminates against the Brougher dacite.

Q. Just refer to the sections in connection with that Mr. Winchell, please?

A. It is shown on section D of Exhibit G. Raise 440, Raise 484, Winze 440, Raise 586 represent the relation in cross section of this south branch of the main West End vein to the vein itself and the cap rock, the dacite cap as shown in the green color terminating its upward course.

404 Q. I do not know whether I asked any other witness the question, therefore I will ask you now, Mr. Winchell: You say this south branch terminates in its upward course against the cap?

A. It does.

Q. And where cut by this plane of section, section D, on Exhibit G, how far does it lie above the main south dipping vein where the branch is intercepted in its upward course by the cap rock?

A. About thirty five feet from the hanging wall of the main West End vein to the foot wall of the south branch.

Q. Calling your attention to section C, we have shown on that as I understand the north dipping vein and the main south dipping vein and the Fraction vein?

A. Yes, sir.

Q. If the main north dipping vein—or the north dipping vein had continued its course upward a little beyond what is shown in this section, and the Fraction vein continued on its course a little further upward, the north dipping vein would have united with that, would it not.

405 A. Yes. It should be explained that this plane of section lies between those two workings. Does not actually cut either of them, at the tops.

Q. I know, but if extended easterly and westerly, they would soon unite?

A. Quite true.

Mr. Lindley: In other words, they are forced into the plane of the cross section?

Mr. Dickson: I say that if both veins were continued easterly or westerly for any considerable distance, and both veins continued on their upward course, as a matter of course they would unite.

Mr. Lindley:

Q. Instead of two veins, it would be a horse in there, wouldn't it?

A. It would, unless the north dipping vein extended still farther.

Mr. Lindley: Well, we won't discuss that. Pardon the interruption.

The Witness: I do not like the term "forced" into the plane of the section.

Q. I mean it does not lie in the plane of the section?

A. If a painter paints a view of a tree, upon the canvas he has got the branches, very few of which are in one plane, but he has got a correct representation of that tree upon the canvas.

Q. Yes, but it is obvious the branches are tied to the trunk. Proceed, Mr. Winchell. Pardon the interruption.

A. I was going to say that the top of raise 422 A on the Fraction vein is 16 feet from the section, and the top of raise 2 A is 30 feet west of the plane of the section.

406 Mr. Dickson:

(Q.) That is on the north dipping vein, the last one?

A. Yes, upon the north dipping vein, and that the plane of the section is between the two, so there is a slight amount of projection.

Mr. Lindley:

(Q.) You objected to my using the word "forced." I won't use it again.

The Witness: Thank you, Judge. I wanted to explain my conception of it.

Mr. Dickson:

(Q.) I will direct your attention for a moment, Mr. Winchell, to section A on the same exhibit. You have spoken in your testimony thus far of the south dipping and north dipping vein, and the Fraction vein being in places and for a very considerable extent in a homogeneous rock having the same rock for the hanging and foot structure. How is that represented on Section A? Is there any difference there, or intended to be represented, in the character of the foot wall country of those two veins and the hanging wall country?

A. There is a difference; and that difference is indicated upon section A of Exhibit G. The formation is trachyte as a whole. The lower portion of this fomation, as it lies in the ground, has in it evidences of more rapid colling than the upper portion. It has, therefore, been called glassy trachyte, while the upper portion is simply called trachyte. They are both colored violet upon section A of Exhibit G, but small dashes or lines of the same coloring in that portion of the trachyte which underlies the vein represents or indicates that difference.

Q. Now, the Fraction vein, as represented upon that sec-
407 tion, what is its foot *and* hanging?

A. That is entirely in the trachyte, as distinguished from the *gal*ssy trachyte.

Q. How is it with reference to Section "B" on that same exhibit?

A. Section B shows the north dipping vein lying between the trachyte and the glassy trachyte. It shows the main west end vein for a small portion of its extent upon this section, namely, in 500 C stope and raise 569 for a distance of less than 200 feet occupying about the same horizon, but the remainder of the south dipping vein is in the normal trachyte.

Q. And the whole Fraction vein is shown upon that section?

A. And the whole Fraction vein, as shown to a limited extent, is in the upper portion of the trachyte.

Q. Take section C.

A. Section C is through an intermediate portion of the ground running through raise 2 A. Nearer the eastern end than the western end of the west End claim. And here we have rock which has been called West End rhyolite as a foot wall rock and trachyte overlying the veins.

Q. Now, take the upper section, section D, and what is the character of the foot and hanging wall country of both veins as shown upon the plane of the section?

A. Trachyte or altered andesite constitutes the hanging and foot walls of the main west end vein. The south branch, however, for a portion of its distance lies beneath the cap rock.

Q. And in contact with it, practically?

A. Well, there is some brecciation and some doubt about
408 it. There is a small wedge of normal trachyte above the vein at the top of raise 484, between the cap rock and the vein. At some other places it is possible the cap rock lies immediately upon the vein.

Q. Going back to Section A, is the rhyolite shown on that encountered anywhere else on the section?

A. Yes. There is what may be trachyte shown——

Q. Trachyte or rhyolite?

A. West end rhyolite, shown below the Jim Butler winze in a cross cut extended to the north.

Q. And colored on that section?

A. Brown.

Q. Brown. So far as the developments have enabled you to observe what the upper hanging wall and foootwall country of these veins are, what would you say as to whether the greater portion of the south dipping vein, we will say, lies in a homogeneous rock or on a plane of contact between differing rocks, namely, ryholite and trachyte?

409 A. Well, by far the greater portion of this main West End vein lies either entirely in the upper portion of the trachyte, or, in the trachyte near the change which occurs in its lower portion.

Q. Glassy trachyte?

A. What you call glassy trachyte.

Q. A few questions now, Mr. Winchell,—I wish you would indicate, as best you can on the model,—there is some interruption to the line of working,—the course or direction of the apex of the north dipping vein from the west to the east.

Mr. Lindley: The compass course, or general direction?

Mr. Dickson: The course or direction of the apex,—not what the engineers call the strike.

A. No, that is not the strike. I understand you are asking me for the direction of the top of this vein.

Q. The north dipping vein.

A. The north dipping vein, as it is developed in the workings, and as we assume it to be connecting actually developed points?

Q. Yes?

A. The direction of its apex is approximately N. 80 West.

Q. And approximately,—of course you cannot give it accurately,——

A. I have not attempted to measure it accurately, but just with my eye.

Q. And, approximately, what is the course or direction of the top or apex of the south dipping vein at their plane of union?

A. It is nearly east and west.

410 Mr. Lindley: The last portion of your question, Judge, was along the plane of intersection. I did not understand the question. Please read the question.

Mr. Dickson:

Q. What I mean is the approximate course or direction of what the witness claims to be the top or apex of the south dipping vein, he having testified that that is where that vein unites with the north dipping vein. Do you understand, Mr. Winchell?

A. Yes. Nearly east and west. Now, I should like to explain that those two directions do not represent the strike of these veins; that their approximation to coincident is due to the fact that the veins have opposite dips and strike toward each other, and, therefore, regardless of any earth movements, their line of intersection will be a descending line toward the east; this tendency to descend toward the east has been accentuated and increased by small, north and south fractures which have dropped them still further toward the east.

Q. What is the strike proper,—the engineers' strike of the main south dipping vein?

A. It is about North, 70 East.

Q. And what is the strike of the north dipping vein?

A. Oh, approximately, North, 40 West, although both of them are subject to local variations in direction, caused by differences in the dip, caused by differences in the strike, and by faults.

Q. Where, in your opinion, is found the top, or apex, of the south dipping vein?

A. At the point where it meets the north dipping vein. In some cases this is on the foot-wall of the north dipping vein, and
411 in other cases it is within the north dipping vein, because of this easterly movement of which I speak, which has caused the south dipping vein to cut into the north dipping vein like a knife.

Mr. Dickson: I think that is all.

At this time an adjournment was taken until 10 o'clock A. M., December 12, 1914.

412 9.

SATURDAY, December 12th, 1914—10 o'clock a. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Company.

Mr. Dickson: Mr. Winchell, take the stand. If the Court please, there is one question I want to ask.

Direct examination of HORACE V. WINCHELL, resumed.

Mr. Dickson:

(Q.) I wish you would state to the Court, Mr. Winchell, what, in your opinion, is the process or the agency by which ores are deposited in metalliferous veins, generally; not universally, but the general agency?

A. I think it is generally believed that ores are deposited in veins from solutions which carry the quartz and metallic substances and which follow along channels in the ground, usually in an ascending

direction and by chemical reactions precipitate and deposit the substances which they bear in solution.

Mr. Dickson: You may proceed with the cross-examination. That is all.

413 Cross-examination.

Mr. Lindley:

(Q.) Had you ever had any experience in the Tonopah district before you came to this place for the purpose of examining these mines?

A. I had no extended experience. I had been to Tonopah and in some of the mines before this occasion.

Q. For the purpose of making any critical examinations?

A. Not for the purpose of making critical examinations, but for the purpose of informing myself regarding the general geological conditions.

Q. How extensive has been your investigation with reference to what you call the south vein—south dipping vein?

A. I have examined this vein throughout the openings in the territory shown upon the model, so far as they are accessible.

Q. Have you examined this vein in other territory other than what is shown upon the model?

A. I have not.

Q. Do you know how extensive it is outside of the particular zone in controversy?

A. No, I do not. I do not——

Q. Your testimony and your deductions that you make from your examination are confined in a scientific sense to the immediate area in controversy?

A. They are.

Q. You do not know what character the vein takes in other directions and other places, if it exists in other places?

414 A. No, so far as I am aware there is no extensive development upon the vein outside of this territory. If I had heard that there were, I should have examined it, and I find the developments in the territory in question extensive and sufficiently comprehensive to enable me to arrive at a conclusion regarding its relations.

Q. With reference to the characterization of this vein, I understood you to say that to a certain extent it lay along the planes of contact between two rocks—between rocks of two different periods or two different classes of rocks?

A. It does, and to a larger extent apparently does not.

Q. That is to say, for what fraction of the extension of the vein in this territory is the vein a contact vein?

A. I should say for less than half the distance over which it is developed in this territory.

Q. Then, it lies half as a contact vein and the other half in homogeneous rock?

A. Less than half as a contact, perhaps a little more than half in homogeneous rock.

Q. Not knowing the existence of the vein outside of this particular territory, you do not know whether it continues to be for its greater part a contact vein or not?

A. I do not know, but I should not think that the fact that it might occupy a contact for a very great distance outside of this territory would affect my conclusion that in this territory it is a fissure vein.

Q. Well, now, in the order—in the genetic order, in the order of creation, I understood you to say that the older of the two
415 veins first formed is the south dipping vein?

A. That is my belief.

Q. That is your belief. And at what period of time was that formed with reference to the enclosing rocks, that is, the order of the deposition of the rocks underlying and overlying? In other words, what was the geological condition, the status of that ground at the time the south dipping vein was formed?

416 A. The only thing of which we can be certain in that regard is that the rocks immediately above and below this vein were there at the time that the vein was formed.

Q. Well now when you speak of the formation of the vein, what process do you include from the beginning to the end of its formation?

A. In the first place the fissure was formed by movement of the earth; it is obvious that there must have been rocks in which to form the fissure; in the next place a certain amount of quartz or rather an uncertain amount of quartz, was introduced along this fissure; the fissure was in the trachyte and to a certain extent followed the plane of contact between the trachyte and rhyolite, therefore both of those rocks were present in the ground before the fissure was formed.

Q. What is your idea as to how that fissure was formed, dynamic force or contraction of the rocks?

A. Dynamic force.

Q. In all cases?

A. It is not a contraction fissure.

Q. Well it is the result of some dynamic force?

A. Yes.

Q. And that dynamic force is a sudden rupture, or is it a gradual rupture?

A. It might be either.

Q. What do you consider it in this case?

A. I presume that it was the result of an accumulating stress in the earth.

Q. This particular region has been the scene of intense volcanic activity?

A. Very.

Q. Accompanied by eras of extensive explosions and intrusions of the volcanic flow?

A. We find indications of at least one such volcano in this immediate territory, that which I have mentioned as the Mount Brough-
Dacite breccia.

417 Q. Well, with reference to the different periods of formation of these rocks, is it your idea that there was any considerable lapse of time between the formation of the underlying rock and the next in succession—or were they practically contemporaneous?

A. I think that geologically speaking there was not a great epoch between the different successive volcanic flows, but that in point of time humanly measured there may have been a very great interval.

Q. In other words when we think in terms of geological time we must forget our ordinary thoughts and ordinary time. It that it?

A. Yes.

Q. When you say that one vein was formed and immediately subsequent to it another vein—what do you mean measured in time?

A. I mean without the intervention of any great change, geologically.

Q. When we use the term "immediately subsequent" in ordinary human affairs we have a different idea as to what that means. Can you give us a definite idea as to what you want us to understand by your term "immediately subsequent"?

A. No, sir. I mean as the next immediate event succeeding the event just described.

Q. Well, that may have been a hundred or two hundred thousand years?

A. Might have been a million years.

Q. Then your expression of "immediately subsequent" does not mean anything so far as the measurement of time is concerned?

A. Geologically only.

Q. Geologically only. Now your order of occur-ence after your vein bearing rock was formed, is the creation of the fissure which formed the south dipping vein?

A. Yes, sir.

Q. And that formed the fissure first. When was the process of mineralization complete?

418 A. When was it complete?

Q. When was it commenced and when did it end?

A. That I cannot tell you. It commenced after the formation of the fissure and ended with the cessation of the movement of the mineralizing solutions.

Q. Well, was that a completely formed vein at the time that the north dipping vein was formed, geologically speaking?

A. Yes, I should say that it was, although there was *rp*obably an additional amount of silicification, or possible mineralization deposited in the south dipping vein, at the time of the mineralization of the later north dipping vein.

Q. How are you able to determine that this Fissure vein, this south dipping vein, was mineralized before the other?

A. Because we find the other vein cutting directly across the vein with its continuous mineralization, interrupting the south dipping vein, on its upward course, visible and evidently a later phenomenon.

Q. Might that not have been the result of subsequent readjudtment, or faulting?

A. If it were the result of faulting——

Q. Might it not have been,—can you answer the question?

A. Yes; it might have been.

Q. I do not object to the witness explaining after he answers the question.

A. I will endeavor to do that. It might have been, and I suppose that that is precisely what did happen, that there was faulting, and that along the plane of that fault the north dipping vein was deposited or formed.

Q. In other words your north dipping vein constitutes a later fault fissure?

A. It is a fault vein.

Q. If that true where it lies along the contact?

419 A. There has been movement along the contact but I imagine from what I have seen that that movement is still later and may possibly be going on up to the present time.

420 Q. There are quite marked indications of movement on the walls of this fault?

A. You mean now the north dipping fault vein?

Q. Yes?

A. Yes, there are decided evidences of recent movement along that vein.

Q. Well, when you use the term recent, do you use that in a geological sense or in the modern, the ordinary human sense?

A. Well, I should apply even more closely the idea of time as regarded in human relations to that, because I say there may even be movement along that fault vein lasting down to the present time.

Q. Well, as a matter of fact, the movement is going on continuously, is it not, in the rocks in the mountains?

A. Well, I don't refer to the movement caused by the influence of the sun and the moon; the influence of local surface erosions and readjustments. I mean movements of considerable extent, as one general movement.

Q. Well, now, will you tell us what you mean by movement of considerable extent? Define it in space, if you can.

A. When the frost operates upon the surface of the ground, waters entering the superficial crevices and freezing there, the superficial area is affected. The effect——

Q. In other words, the rocks are disintegrated?

A. The effects of freezing the water is to expand and tear apart small particles of the rock. When the sun thaws that ice, there is a tendency for the surface to creep down hill, for the particles to separate. That is a small movement.

When, as the result of crustal adjustment, there is a move-
421 ment of one large mass of rock upon another, that is a large movement.

Q. That is regardless of the extent of the movement measured upon horizontal or vertical plane?

A. Yes sir.

Q. Then by saying it is a large movement, you do not mean the

removing of one block of rock to any serious distance from its original habitat?

A. No, but a movement extending in general direction over a considerable area, although the distance of the actual movement may be small.

Q. Then, if we were to state that this movement has taken place, and if the movement along this fault vein existed in recent times, would it not displace the cap rocks?

A. Very likely.

Q. Well, wouldn't it be necessarily so?

A. No sir. That depends upon its relation to the cap rock.

Q. And depends upon whether the movement was extensive in direction?

A. That would depend upon whether this fissure enters the cap rock.

Q. Well, along the plane of contact between the two rocks?

A. Yes.

Q. Do you have in mind any particular place where the cap rocks have been displaced by this movement?

A. I think there are very few developments which would make possible a definite reply to that question. I haven't any doubt, however, that if this movement or this fault fissure enters the
422 cap rock, that there has been displacement of the cap rock by it.

Q. Well, if this movement occurred, if the formation of the fissure, the fissure underlying the cap rock, you do not want us to understand that nothing but the fissure movement or nothing but the faulting between the walls moved? Necessarily must it not have been the fact that the cap rock also moved?

A. The cap rock moved, but it must have moved in some direction, and it could not have moved unless there had been some fissure passing into it or underneath it.

Q. Just excuse me a moment.

A. Yes sir.

Q. Mr. Winchell, you are quite efficient in making representations. I am going to ask you to give us the evolution of these veins on a sheet of white paper, if you will kindly do so. Take it in cross section of your plane, of cross section C or B. Inviting your attention to Section B, I have placed on the black board here, Mr. Winchell, an exhibit which we may mark "Winchell X I," and so identify it in the record.

Mr. Dickson: The X standing for cross examination, I suppose?
Mr. Lindley: Yes; *1* for cross examination.

Q. Now, this represents a cross section through the 569 raise and corresponds practically, I understand, to your section B. I would like to have you take a red lead pencil and delineate on that cross section first the quartz or vein in the south dipping vein, as you understand it was originally formed?

A. Judge, I have here a sketch which I made myself of
423 the same raise, the same situation.

Q. You may use that in putting the colors that I am going to designate to you on here. I am going to ask you to first delineate in red the vein occurring in the south dipping fissure and carried up to the point where you say it ceased to be a vein at the time the north dipping vein was formed. Just the quartz in red; not vein matter, quartz.

A. Well, the quartz is very often considered——

Q. Is that a red pencil, Mr. Winchell?

A. That is not a red pencil. It is for my own guidance.

Q. I beg your pardon.

A. I have a red pencil. This is not according to my idea of a cross section of the workings, but I can come approximately.

Q. Now, we are getting first the period of the south dipping vein.

A. I am not very much of an artist, but the quartz of the south dipping vein was deposited in it approximately up to the line which I have indicated on this exhibit, 'Winchell—S. 1.'

Q. Was that all there was in your judgment in the vein at that time, that is, prior to the formation of the north dipping vein?

A. Yes, that is all that there is left of it.

Q. Is it all that there was?

A. Well, I have not expressed any such idea as that. There may have been a segment of it which has been removed, that was above what is now the north dipping vein.

Q. Now, I want you to put that on exactly, in detail, from your notes, that geology at that point; have you put on there all you wish to indicate as quartz?

A. Yes.

Q. As constituting the north dipping vein,—that is on
424 this level?

A. Yes.

Q. The south dipping vein, I mean?

A. Yes.

Q. And what have you to say as to whether that was the terminal edge of that vein at the time the north dipping vein was formed, or whether that vein has still an upward extension?

A. I say that in all probability that this terminal edge was formed by the fissure in which the north dipping vein has, later been deposited.

Q. That is the present termination?

A. It is, and it has been the termination since the formation of the north dipping vein.

Q. I want to know the conditions there as they existed before the north dipping vein?

A. In all probability the south dipping vein extended further upon its course upward towards the north.

Q. Show what you think would be it- probable extension in that direction then?

(Witness indicating.)

Q. The dotted lines there will represent what you think is the probable extension of that vein on its upward course?

A. Yes, practically.

Q. Well, you may go on there and continue with the designation of the quartz, and the details of the geology in the north dipping vein.

Mr. Dickson:

Q. What color are you adopting for that?

A. This is just a boundary line.

Q. What color are you going to adopt for it?

A. He asked me to put on the details of the geology.

Mr. Lindley: We will put on the quartz of the north dipping vein. We will get at the geology in a minute. Put the quartz in
425 in red Mr. Winchell—I want the quartz in red.

A. (Indicating.) That in a general way indicates it.

Q. Now, I wish you would take a blue pencil and mark the gouge on the north dipping vein?

A. You are asking for greater detail than my notes permit me to give with positiveness; the general relations are so evident that I have not taken each inch by itself.

Q. Well, you recall the structural conditions as you have seen them in the ground in that upraise?

A. I do, very well.

Q. Very well.

A. Structural conditions are very well, but each detail as I say is not so very clear. I would like to know where the top of the raise is on this section, how far from this shoulder.

Q. Eighty feet.

Mr. Dickson: What is the scale, gentlemen.

Mr. Lindley: Twenty.

A. Now, does this working here connect with the Tonopah Mining Company?

Q. Yes.

426 Q. Have you delineated now all of the quartz that exists *of* that you believe exists in that cross section?

A. No, there is a little more here (marking same). That represents it substantially in accordance with my notes. We have here additional lines, broken lines, representing quartz that is not there at all, that I put on at your request.

Q. Well, that is the faulted—that is hypothetical in the early stages of the game, showing the formation of the north dipping vein. You may indicate the upward extension there in a black pencil line, and you may mark that A prime and B prime, indicating the probable upward extension of the south dipping vein before it was cut off, as you say, by the north dipping vein?

A. I have so indicated.

Q. Now, you have delineated on the upper part or in the north

dipping vein or on the hanging wall of the north dipping vein two blue lines?

A. Yes sir.

Q. What do those represent?

A. Those indicate the gouge, or a line of clay selvage which is pronounced above the north dipping vein.

Mr. Dickson:

(Q.) Above the north dipping vein?

A. Yes.

Mr. Lindley:

(Q.) Do you understand that the gouge shown in raise 488 by the blue line, as you have indicated, is the same gouge that is shown in raise 537 indicated in blue?

A. I presume it is the same.

Q. That is your understanding?

A. Yes sir.

427 Q. Now, will you just mark by the usual geological designation the enclosing rocks there? I do not mean necessarily the——

Q. You want the colors?

Q. I do not mean necessarily the symbols, for instance, if it was midway andesite, mark it "M A."

A. I do not know what midway andesite is.

Q. Well, what do you call it then?

A. Well, what do you call it?

Q. What are your foot wall rocks? Take it across the cross section B, Mr. Winchell, and put on your designation—instead of dotting, your lines, it takes so long to do that; Section B.

A. The colors probably would——

Q. Very well, take separate colors and then we will get at it that way.

A. I will indicate it green for cap rock over the top of the raise and mark it "Cap." I do not find any purple here. However, I think it will be sufficient to say that except for the green, which I have marked, the surrounding rocks on both sides of the veins above and below, so far as disclosed, are trachyte.

Q. Both of the same age?

A. Yes.

Q. Do you divide that trachyte into—is that a contact vein at this point shown in the cross section?

A. No, it is not.

Q. Are the underlying rocks different from the overlying rocks?

A. They are not different in age, nor in identity, but there is a different phase of a portion of the trachyte which is seen in raise 537 and the level immediately below it.

428 Q. You have glassy trachyte on the foot wall?

A. For a portion of the distance only.

Q. Mark the distance that you have the glassey trachyte on the foot wall there, if you can.

A. I can't tell exactly.

Q. You do not know how far it extends?

A. I do not know how far it extends.

Q. Do you know a point in this section where it does not exist in the foot country?

A. I have not taken this rock beneath the south dipping vein under raise 569 to be glassy trachyte, although there may be a slight shading off, even there. There is no sharp and fast line of separation between the glassy trachyte and the trachyte. The glassly trachyte is assumed to be a cooling phase of trachyte, and it merges from one phase into the other so that you can't draw a sharp line frequently between them.

Q. Did I understand you to say in your direct examination, perhaps I misunderstood you, Mr. Winchell, that some sections of this vein lay on a contact between glassy trachyte and another kind of a trachyte?

A. I said that the two kinds of trachyte seem sometimes to appear, one above and the other below.

Q. As the hanging and foot?

A. Of the vein.

Q. And where they did occur, you call that a contact vein?

A. I did not.

Q. You did not in your direct examination?

A. I said, in the line of contact; that would not make
429 a contact vein.

Q. What is a contact vein.

A. A contact vein is a vein accompanied by contact metamorphism *by contact metamorphism*, in which metamorphic minerals have been deposited; here ordinary vein minerals were deposited and none of the contact minerals have been found.

Q. Well, then, a contact is not a question of physical expression, it involves the idea of the character of the minerals?

A. Very often and to a certain extent necessarily.

Q. Your idea is not that contact vein lies between two different classes of rock?

A. No, that is not a contact vein.

Q. Isn't that what the miners call a contact vein?

A. No, I think not. But even if it does, as I before remarked follow a contact for a certain distance, the fact that it departs from the contact, and cuts through homogeneous rock negatives the idea that it is a contact vein; it is simply a fissure that for a certain distance pursues the line of contact.

Q. Well, that would make it a contact vein then?

A. No, because of the absence of the metamorphism, I have just described to you.

Q. Well, of course, we were not all educated in a geological atmosphere; what I want to ask you is, where in the ordinary common parlance in the mining world—what you understand by the meaning of the word "contact"?

A. Perhaps I should have expressed *by* definition sooner, but if you refer simply to a vein, fissure, or what not, that lies at the

meeting point of two different rocks as a contact vein, then you do not understand the contact vein as I do.

Q. The trouble is that perhaps we do not think in the same atmosphere. I am getting at the term "contact" as used in
430 the common parlance; if you will forget for a moment that you are a geologist and put yourself in the place of a common miner, when a miner defines a contact vein, what does he imply?

A. Ordinarily that he has limestone on one side and an eruptive rock on the other.

Q. He may have different eruptives on two side- and still——

A. He would have to be more than an ordinary miner to know the difference between the two eruptives.

Q. Don't you think that a man working in this camp can tell the difference between the glassy trachyte and the other, to distinguish them?

A. Where the samples are taken at widely separated distances, but not where they shade into each other.

Q. Then you do not want to call this a contact vein at this point?

A. I do not.

Q. In the miner's significance of the term?

A. I do not.

Q. Well, now, with reference to this gouge,—you say that forms a hanging wall of the north dipping fissure, and you have indicated that in blue. There is a dotted red line connecting the 488 with the 537 raise; that indicates the probable quartz extension in those two?

A. Yes.

Q. Should that gouge extension also be dotted in blue?

A. It presumeably extends.

Q. Will you please dot it in blue?

A. Yes.

Q. Now, that is your idea of what happened, and that gouge which you speak of is the result of attrition movement?

A. Yes.

Q. It is a heavy gouge?

A. Persistent, not extraordinarily heavy, but noticeable, and forming a clean separation between the quartz and the over-
431 lying country rock.

Q. Well, how thick is it?

A. Its full thickness may not be entirely exposed, but it is usually only tough—clay for an inch or tow, and the breccia which lies just above it, two or three inches more; altogether not more than six inches.

Q. Well, does the volume of that gouge indicate the extent of the movement?

A. It does not.

Q. It does not necessarily mean that there was a great movement in any particular direction, or it does not necessarily mean that it was a steady grinding?

A. It does not because in this ground there have been a great

many movements at different times, some of those movements have been extensive; I mean now over the whole camp. Some of these movements have been very small; the more extensive movements which were accompanied by the larger amount of attrition movement or gouge in the earlier stages have been followed by silisification which in many instances has obliterated the gouge and turned it into quartz; therefore some of the more recent movement- may have a larger amount of gouge, than far more extensive movements of an earlier period.

Q. I see that you have marked on that diagram a red shade, some heavy and some light. You did not mean to make a distinction?

A. Yes.

Q. What distinction?

A. Heavy quartz as is marked heavy red,—more continuous.

Q. Not any different in character?

A. Yes,—there is a colored quartz found there, some light and some dark and that is different in character.

Q. Well, is there any difference in the character of quartz
432 in these so-called two veins?

A. Oh, yes, there is a difference from place to place in each vein.

Q. Well, I mean by that taking the vein as a whole, do you base your conclusion that this north vein is a separate vein because the character of the quartz is different from the quartz in the other vein?

A. Generally, from a commercial point of view, or as you say that of a common miner, the quartz to the eye appears similar, but there is a far greater amount of mineralization, ore, in the south dipping vein than in the north dipping vein; in that respect the quartz is different, there is a greater thickness of quartz in the south dipping vein than in the north dipping vein.

Q. Is that true all through the two veins?

A. That is true generally. In other words the fissure on one side is larger than on the other and the replacement in one vein has taken place to a larger extent than in the other.

Q. Is there any difference in the vein filling?

A. In the respect of mineralization there is.

433 Q. Well, what is the difference?

A. More ore has been found in the south dipping vein than in the north dipping vein.

Q. Any difference in the character of the mineralization?

A. That I can't say. I think not. Not to the eye. Not any greater difference than might be found between different stopes on the same vein.

Q. Is there any physicial line of demarkation at the point where you say the earlier vein appears up against the later?

A. There is.

Q. What is it?

A. There is a well defined and continuous band of ore which

has a thickness of four inches above the raise 569 and 20 inches in the cross cut extended between 569 and raise 537.

Q. Well, that is the thickness?

A. That is what you asked me, wasn't it?

Q. I asked you if there was any physical distinction. I meant in the line of demarkation. Ordinarily you can tell when one thing ends and another begins, if they are in close contact, can't you?

A. Yes.

Q. Well, how do you tell that the south dipping vein ends along a certain plane and the other begins at a certain plane? What physical evidence of it to the eye of any man mining underground?

A. The evidence is unmistakable and as clear as the meeting point of a window casing *any* the wall. The south dipping vein with its structure, its dark and light quartz, dips towards the south, and following up upon its dip from the south we come
434 abruptly against the north dipping band of quartz which I have described as 4 inches in thickness in the back of raise 569, and 20 inches in thickness in the cross cut which has connected, running through quartz the north dipping vein with the south dipping vein.

Q. Don't they match up pretty closely?

A. Don't which match up?

Q. The two veins as they come together physically?

A. At this point they do not.

Q. Well, do they not generally so?

A. They don't match any closer than a dictionary against a Bible.

Q. Do they not generally match up so it is impossible to distinguish one from the other, except by change in the dip?

A. No sir, it is absolutely impossible to confuse the separation and distinction here. You can't mistake it.

Mr. Dickson:

(Q.) You mean in this particular section?

A. On this section. There are places which I mentioned, where the silicification has been so intense in this wedge of rock between those two veins that it is difficult to ascertain the direction of either vein passing through the large masses of quartz that have been deposited in that vicinity. But some of that quartz was there before the veins were formed.

Mr. Lindley:

(Q.) Now, let us go back to this gouge business a little more. You have indicated there the line of gouge, or what you call the hanging wall of the north dipping vein in blue, a dark blue; that you take as the gouge wall?

A. Yes sir.

435 Q. Have you got any quartz above that wall?

A. There is frequently a little scattered quartz and cal-

cite noticed in the vicinity of that gouge. That is not comparable in any way with either vein, nor resembling it in the character of its deposition.

Q. Well, that upraise does not show any other quartz except the kind of quartz that you have just described after it passes through that blue gouge in raise 537? Does that raise extend up to that red line?

A. Yes.

Q. Now, in the intervening space, you have no quartz except what you have designated on there?

A. That is all highly silicified rock. It is not quartz which is mineralized. It is not quartz which has a definite banded structure, but I would not be at all surprised if there might be some sympathetic quartz stringers passing across that raise in the general direction of the north dipping vein.

Q. That is outside of the vein hanging wall. How about the blue gouge over on the south dipping vein, what is that?

A. There is a wall there which has not nearly as much gouge upon it, which marks, however, the hanging wall of the south dipping vein.

Q. Well, compare the two gouges as to thickness and character?

A. The gouge over the south dipping vein is not clay. It is not tough, it is not so dark colored, it is not so thick, nor so generally in evidence as that over the north dipping vein.

Q. Well, the character of the rocks is the same in which
436 the vein——

A. They are. The character is the same.

Q. Don't gouge take its color from the rocks in which the vein exists?

A. Sometimes. Sometimes it takes it from the quartz which has been crossed.

Q. What is the normal color of quartz?

A. It hasn't any normal color.

Q. What color does it have?

A. All colors. Black, white, red, blue, green, pink.

Q. Well, silica is quartz, isn't it?

A. Crystallized silica is quartz.

Q. And quartz is crystallized silica?

A. Yes.

Q. And if there is a change in color, it is due to the injection of some other mineral?

A. The inclusions of some mineral, or of gases or bubbles.

Q. But when you now say that while these veins at this particular locality are precisely in the same rocks, each having the same kind of gouge, with regard to the general proposition the one has a different color from the other, is that correct?

A. I did not answer you quite fairly. I think that quartz is more frequently light colored than dark. I do not want to be captious about this at all, but there are enormous deposits of quartz in which there is no light colored quartz at all, and in referring to the color of

quartz, I am quite right in saying that it may be any color, but it is more frequently light colored than dark.

Now, as to this gouge, I think the gouge, so far as there is
437 any over the south vein is apt to be of both light and dark colors, but it is not so thick. It has not the same tough clay selvage as that which is generally found lying over the north dipping vein.

Q. Well now, you speak of this north dipping vein, is that the result of a fault? You say it is the result of movement creating the fissure?

A. I consider it a fault fissure vein along which there has been some replacement of the country rock, and the fragment- of which country rock originally lying within it have been entirely silicified and turned into quartz.

Q. What kind of a fault was it?

A. That I don't know.

Q. A normal or a reverse fault?

A. I don't know.

Q. You were not interested in endeavoring to find out?

A. Oh, yes, I was.

Q. And you could not find out?

A. I did not.

Q. Were there any striations or grooving to indicate the line of movement?

A. Beautiful ones, and they are later.

Q. They are later?

A. Yes sir, later than the formation of the original fissure in which the vein has been deposited.

Q. So all evidences of original striations, if there were any, are eliminated by a later movement?

A. Yes. When one later movement takes place, it is very apt to disguise or obliterate the evidences as to the earlier movements.

438 Q. Then there is nothing in the ground by which you could tell whether this is a reverse fault or a normal fault?

A. I don't know.

Q. Have you made any investigations for the purpose of determining, or didn't you think it was important?

A. I have, but I have not been able to ascertain.

Q. Do you think it important to ascertain?

A. No, I do not think it is specially important.

Q. Well, if it had been a normal fault, what would become of this segement of the vein that you have dotted there extending out into the North?

A. It would have gone a greater or less distance down upon the hanging wall.

Q. And would have been found out somewhere in the north, if the north was there, that is, if the rocks were still in place?

A. If the rocks were there.

Q. If that was not a normal fault, that vein was thrown down to the north and has since been eroded, is that your idea?

A. It was eroded probably before the laying down of the cap.

There is a small amount of trachyte resting above the north dipping vein, but not a great thickness, and whatever segement might originally have been there it must now be reduced to a very short stub.

Q. Suppose the fault was the other way, what would become of that segement of the vein?

A. If it had moved far enough, it would be in that region which has been entirely eroded.

Q. In other words, whichever way it was faulted, normal or reverse, it is all gone by your subsequent erosion?

A. There may be a small stub of it farther down around
439 the dip of the north vein, but there is none of it left south of the top of the south dipping vein.

Q. Wouldn't it be a likely thing for people to do if that was a faulted vein, for the miners to try and find it?

A. I should think so if there was any prospect of finding any considerable amount of quartz. But it is also true that there hav-n't been any workings made with sufficient diligence to disclose a small extension of that vein, if it occurs in this ground, and knowing that the cap comes down so close, I should not think it a good prospective piece of work to look for it.

Q. So you are not able to tell whether this is a normal fault or a reverse fault?

A. No, sir.

Q. There are no indicia in the ground by which you can tell, and there is no method of determining the extent of the movement?

A. Well, I am not prepared to say that other more skillful geologists might not determine; might not find indications of the direction of the movement, might not even find something to determine the extent of the movement, but I have not been able to find it.

Q. Well, you have made an earnest effort to do it?

A. I have endeavored to interpret all of the geological phenomena which I found in this ground, to explain the fact, but I have not been able to ascertain the direction or the extent of the movement, along the north dipping fault vein.

Q. And according to your notion it was not necessary for you to determine whether this was a normal or a reverse fault, in order to reach a conclusion as to the conditions there, the geological conditions?

A. It was not. The geological conditions are as plain as day.

440 Q. And it was not necessary for you to account for the method of that fault in reaching any of your conclusions, as to whether it was a reverse or normal fault.

A. It was not.

Q. You are quite positive of that?

A. That is my opinion.

Q. Are there any other faults in this section of the mine; shown in this neighborhood?

A. There have been a great many small faults, an innumerable number of them. The ground is cracked and faulted in various directions. I have already referred to the fact that before the for-

mation of these veins, there are indication- of north and south breaks, along which extensive silicification occurred.

Q. Well, anything which you might put in the category of major faults?

A. No, sir, I have already mentioned the indications of a movement, recent movement, after the formation of the north vein above the south vein, towards the east, which caused the south—the upper edge of the south vein to protrude into the quartz that had been deposited before that movement occurred in the north dipping vein.

Q. I am now going to show you two samples. I think that you testified that the south vein dips into the north vein like a knife edge?

A. Yes, sir.

Q. Will you explain that?

A. I say that it projects into the north vein quartz, having actually cut into it by movements which are registered in the shape of groovings over the hanging wall of the north vein. These groovings run nearly east and west and lie nearly horizontal, and it has—wherever the south vein has been sufficiently resistant and solid—it has cut into the quartz of the north dipping vein, so that at some points it nearly reaches the hanging wall of that north dipping vein.

441 Q. The mark made upon the north vein by the south vein was made in the vein matter of the former?

A. Yes, sir.

Q. This vein matter was marked or grooved by the movement of one vein butting against the other and most have been deposited before this movement occurred?

A. Yes sir.

Q. Is there any mineralization of the surface of the groove or furrow formed by the north vein on the south vein?

A. That is quite a recent movement. There has not been any deposition of quartz there. There is sometimes a little calcite.

Q. Can you answer that question categorically? Is there any mineralization of the surface of the groove or furrow formed upon the north vein by the south vein?

A. What do you mean by mineralization?

Q. What do you mean by it?

A. I shall have to ask you to define it before I could answer the question.

Q. Define it as to your conception, what you term the mineralization.

A. It means two things. The miner means the deposition of something valuable. The geologist means the deposition of any kind of mineral.

Q. Now, can you divide the question and put it hypothetically from the standpoint first of a geologist and then from the standpoint of a miner. We will get it both ways.

Q. We have along the grooves the formation of smooth slickensided surfaces which are arranged—in which the particles
442 of mineral are arranged in one direction rather than in a

cross direction; arranged in the direction of the movement. And sometimes mineralization is a mechanical process. In the sense in which mineral might be deposited in a certain spot by mechanical processes in combination with chemical processes we frequently have a mineralization.

From the miner's view, I haven't seen anything which would lead the prospector to drive in that direction with the idea of finding ore.

Q. Well, as a matter of fact, before the advent of the geologists and the experts, a miner mined this wherever it was mined, practically one vein, didn't he?

A. Yes, he overlooked some pretty good ore up in the raises up above the south dipping vein.

Q. Now, let *up* parenthetically depart from that. You said there is some ore in what dipping vein? South dipping vein?

A. In the north dipping vein there above the south dipping vein.

Q. Where?

A. Raise 4 A and 5 A.

Q. How far up the raise?

443 A. Forty or fifty feet.

Q. How do you know that it is good milling ore?

A. You can see the silver in it, the silver sulphides.

Q. How much of a stope is there there?

A. There is not any stope.

Q. How much of an ore body is there there?

A. Two or three feet in places.

Q. How long?

A. I don't know, only shown in the raise.

Q. What right have you to say that there is a large body?

A. I did not.

Q. What did you say?

A. I said that he overlooked some good ore.

Q. That might have been a thousand pounds or fifty?

A. Yes, but it is enough to lead a prospector to do some work, rather than following the little clay gouge; it is ore.

Q. Yes, but in order to get ore you would have to drift up through barren quartz fifty feet?

A. No.

Q. Or what would you go up on?

A. On good quartz, but not so rich as some higher up.

Q. The fact is that you did not go up in the 5-A raise on anything?

A. I have heard it testified here that the 5-A raise was driven before this litigation started.

Q. You know that there is no stoping done there?

A. There is no stopeing here.

Q. That as a matter of fact that 5-A raise was there when you came to the mine?

A. Yes.

Q. These other raises were put up subsequently?

A. 488; 2-A; 5-A; 6-A and 7-A were all there at the time of my

first examination, probably last April; they have been extended some since them,—I don't know how much; I think 488 is sub-
444 stantially as high as it was at that time.

Q. These raises are litigation raises all except 5-A,—that is to say they were not done in the ordinary process of mining?

A. No, they were made for the purpose of developing the geological conditions in the mine.

Q. Does not it appear to you that *there* are pretty close together for mining operations?

A. Rather close together for mining operations; they were probably and presumably multiplied in number because it was easy to anticipate that our friends on the other side would say only 'one raise up there' do you think that demonstrates anything?

Q. Well, a drift from the raise would have been much cheaper than five or six raises?

A. No, a drift would not have served the purpose; each raise carries the vein to this cap, and a drift along that cap might not have been a drift at all; it might have been a series of raises and inclines.

Q. Well, it is conceded I suppose that these raises were made for the purpose of this litigation?

Mr. Dickson: That may be admitted.

A. I so understand it.

Mr. Lindley:

Q. And for the purpose of locating the apex or top of these veins, you have there on the model a series of finger-like projections to indicate the raises?

A. Oh, to make it possible to ascertain underground, the precise condition of affairs.

Q. And for that purpose you think that many raises were
445 necessary?

A. No, I did not have anything to do with the putting up of these raises.

Q. Were you not consulted about them?

A. No, they were put up before I got here.

Q. All of them?

A. All but 4-A and raise-A.

Q. You were not consulted about it; that is not your plan of development?

A. I am not the guilty party.

Q. Well, now, let us talk a little about these rocks.

Mr. Lindley: I would like to have these two specimens marked, Mr. Clerk. Have you got a sticker to put on them? We may label them someway or another so that you may label them afterwards.

(Samples marked.)

Q. Now, Mr. Winchell, I am showing you two samples of rock one marked "Win. X-2" and one marked "Win. X-3" and I will ask you if you can tell what,—taking one at a time, taking them in the order of their numbering,—"Win. X-2."

A. Tell what they are?

Q. Yes.

A. Ordinarily I would not undertake to determine from the inspection of a hand sample the species or name of rocks in this camp, when I find that the most experienced students of the camp, geologists changed to their nomenclature and determination two or three times in the course of ten years, after the most exhaustive investigation, and I do not feel a great deal of confidence in my own determination. However, I should presume and provisionally classify (Win.-X-*a*) as glassy trachyte, and (Win.-X-3) as trachyte not very far removed from the glassy trachyte in place underground, and still containing some of the glassy trachyte structure.

446 Q. Well there is no serious difficulty in distinguishing those rocks apart?

A. No, they have not a precisely similar appearance, but yet belong to the same time of rock, and I believe both occurred here at the same period of time.

Q. Is not the glassy trachyte as it is found in this camp, nonproductive, so far as mineral is concerned, in this camp?

A. Generally I think that is true.

Q. That is true?

A. Generally, but there might be found veins within it.

Q. Well, so far as your observation shows, you have not found any?

A. I have not.

Q. The Mizpah trachyte is locally known as the lode prophyry isn't it?

A. Do you call this "Winchell No. 3" Mizpah trachyte, what I call trachyte,—you call Mizpah trachyte?

Q. Yes.

A. I understand that is the formation in which the most productive veins have been found.

Q. Is there any glassy trachyte on the hanging wall side of this vein?

A. I haven't observed any.

Q. Well, you would conclude from that that there is none?

A. Yes,—well, I could not say positively, but I have not observed it, and I have seen the openings that have been made; in a district where rocks have not only been intruded into each other, and poured over each other, and faulted up against each other, and have been of different periods, it would be unsafe for anyone to dogmatize and say, that one rock could not be found at any elevation in the ground.

Q. Well, as far as your experience goes, and I understand that you have made a very careful study of these veins,—you

447 have not seen any in the glassy trachyte?

A. That is true.

Q. You would not want to pass any opinion on what might have occurred,——

A. I am simply trying to be guarded as a prudent man should against making certain and positive statements.

Q. Well, of course all latitude is always allowed to a scientific

witness. Does not the quartz shown on your sketch at B,—I have put two marks on here indicating "X-Y." I will reframe the question. Does the quartz shown in your sketch at Y—

448 Does not the quartz as shown on your sketch at Y, which you say is in the north vein, correspond better in dip with quartz at X, which you say is in the south vein, that it does with quartz in raise 488?

A. I don't think it corresponds in dip with either. I think this is a crosscut made through quartz which has a north and south vertical structure.

Q. Where a vein is flat, the structure is vertical as a rule; where the north and south dipping vein, there would be the place where the vein would be practically horizontal with a vertical dip?

A. Yes.

Q. If it has any vertical dip?

A. If the vein is horizontal the dip is horizontal.

Q. Where the quartz would stand, so far as the eye is concerned, vertically?

A. Where there are evidences of actual vertical structure, not horizontal structure; but this quartz lies,——

Mr. Dickson (int.):

Q. Identify the place you are referring to.

A. This quartz at Y and "Winchell X 1" has very little structure; at different parts of that crosscut you can see a vertical structure and east dipping structure, and flat structure, and north structure.

Q. You have a combination there?

A. You can frequently find that; you frequently find the evidences, indications of the formation of this north dipping vein even below the top of the south dipping vein in the shape of cross-fractures in which a little quartz has been deposited.

449 Q. Does not the quartz at Y follow directly the quartz at X?

A. Yes, so it does up and down. The working might have been made a raise, a vertical raise here in the quartz which has been deposited in the wedge of rock between the two veins.

Q. Was there not a definite ore streak followed by the miners of the West End mine from X to Y when they drove the opening?

A. I think there is some ore in there, but I don't think it is a definite ore streak, although there are places in which this apex or wedge of rock underneath the two veins has been fractured in various directions and quartz deposited in it, so there might be definite streaks running in different directions there.

Q. Isn't it true that the zone between the two, between the south dipping and north dipping veins, is mineralized?

A. Some of it is good looking quartz and other portions of it seem to be absolutely barren, bony quartz.

Q. Now, I wish to take you to cross-section here, raise 573; will you kindly repeat the matter there that you have on the other raise?

A. This section is not complete; there are two raises in the same plane, 461 and a little raise under it, which do not show upon this.

Q. Can you put them on there? I suppose that was the condition when the section was made. Mark it "Winchell X4."

A. Will you have one of your draftsmen complete this section?

Q. Well, that is an exact section. We have not put anything on that that is not in that section. Can you from your notes put in what is in that section? That is an exact section.

450 A. You wish me to call all the quartz red?

Q. Yes. You are extending the quartz above the section?

A. There is a section within 5 feet that shows it extending on up there for 40 feet.

Q. Well, I will ask you Mr. Winchell,—this is an exact section. We have not put anything in there that is not cut on the plane of this section. I do not want to mislead you at all. If you will simply make the explanation that that is shown in this section and is so and so, and that 5 feet away this other occurrence is also so and so,——

A. Do you object to my drawing the red line beyond?

Q. I do not object if you explain that that is not in the plane of the section, but 5 feet away from it.

A. It is in exactly the top of the raise. I do not want to place anything here that you do not want. The bottom of the raise is within 5 feet. I see the raise inclines away from the section upward on its dip; the raise was put up as near as possible to this section and yet not break down the intervening material.

Q. Was that a diagonal raise?

A. It was put up upon the dip and at its top breaks into another raise which is also very near this plane of section, and the two together give a more complete view of the conditions in the ground, as I have them on my sketch.

Q. Will you kindly put everything in quartz into the plane of that section and then if you want to say it is at a certain distance from this section that this occurs and that you are justified in putting it on the plane of this section marked "Winchell X4",——

A. (Indicating.) That is approximately the representation of this section.

451 Q. The red marks, above the line in the section, indicate what?

A. The red lines above the outline of the opening as shown upon the section, indicate quartz which is seen projecting into that drift from the side of the opening, and the two uppermost lines represent quartz which is seen in the raise a short distance to the west of the plane of section, as well.

Q. Well, how far west?

A. I should say 15 feet, at a guess.

Q. Well, they are not seen in the plane of the section?

A. They are seen projecting into the top of the opening behind the plane of section. If you do not wish them extended so far I will erase them.

Q. Oh no, no; I don't care. I just wish to know,—I know they are not on the plane of section.

A. No, they are there. They are on the plane of section.

Q. It would seem that that quartz from right to left, or from north to south, followed over without any serious interruption in that section.

A. There is more quartz which you have not permitted me to put on.

452 Q. Oh, I thought that you had finished.

A. There is lots of quartz below; I cannot say how far, but there is quartz in the floor,—but that is not necessarily all of the quartz.

Q. Put on all the quartz that you have in your notes, that you think is there?

A. Well, there is some quartz in the floor, and in answering your question I may say that the cross-cut extending from intermediate 421, marked "I-421" to the northern or lower end of raise 573, which we call "winze 573"—marked "W-573"—is similar in character to the quartz which is found in the ground beneath the two vein-, and shown upon "Win. X-1."

Q. Well, the addition of that other quartz, which you state was there below the sketch or black line of the sketch, does not change the situation any does it?

A. I do not know how far down to put it; that is not shown on the precise plane of the section.

Q. Is it shown on the floor of the winze or the raise or drift—whatever you call it——

A. Yes.

Q. Of the opening?

A. Yes.

453 Q. Now, will you take those two sections and point them out on the model, approximately where they are so the Court can have them in its mind?

A. I would like to call your attention to the way in which the south dipping vein in its upward course toward the north lies against the foot wall of the north dipping vein in this section, and explain that there is a thickness there of 5 feet of the north dipping vein, and the south dipping vein is plainly shown terminating against the foot wall.

Q. Before you leave this section: let me understand what you meant when you say that? At what point does this south dipping vein terminate against the foot wall of the north dipping vein?

A. In drift 461.

Q. Mark that with something so I can identify it.

(Witness does so.)

Q. Do you call that the foot wall of the north dipping vein?

A. That is the foot wall of the north dipping vein, and there has been quartz deposited below it, probably in connection with the shattered condition of the rock which might well be included within it. But this marks the actual top of the south dipping vein at that point.

Q. Is there any ore in that quartz lying underneath what you call the footwall of the north dipping vein?

A. There has been ore deposited in connection with the mineralization of the north dipping vein.

Q. Where did that mineralization come from, the north or the south dipping vein?

454 A. Came from the later north dipping vein.

Q. All of it?

Mr. Dickson:

(Q.) At that particular place?

A. I understand he is referring to this particular section.

Mr. Lindley:

(Q.) Yes. How do you know?

A. I don't know. That is my impression. That is my belief. I can not tell you how absolutely certain anybody can be regarding the origin of these veins and their succession. I am giving you my best belief in the matter.

Q. Well, I understood you to state it as a positive fact; that is the reason I asked the question.

A. All of these statements, except as to actual matters of fact, are conclusions.

Q. Opinions?

A. Opinions based upon the facts observed in the ground.

Q. Now, if you will, point out to the Court these two sections that we have been discussing here on the model, so that he will know where we are.

A. Raise 569 and raise 488 above it are shown upon the model, just west of the east end line of the west end claim. They illustrate in the coloring the south dipping vein coming up to the foot wall of the north dipping vein, and show the north dipping vein extending upward into raise 488 and downward into raise or winze 537.

Q. And that is the locality where the cross section is taken. And the next one——

A. "Winchell X I." "Winchell X 4" is a section of the raise 573 which comes out of the top of 500 C stope, and is extended upon the south dipping vein until it encounters the north dipping vein

455 in winze 573 and shows it in upraise 461, which is just west of the plane of section.

There is one thing which could not be shown upon the section "Winchell X 4" and that is a little fault whose direction is about north 30 degrees east, which crosses the lower end of winze 573 and displaces some of the quartz which is seen there, and shows that the quartz is not entirely homogeneous but that there are portions of it more completely—more solid and massive than other portions. That fault is shown upon the model, but could not be shown upon the section because it lies nearly in the plane of the section.

Q. To what extent is the ground dislocated, the vein dislocated at that point?

A. At one place there appears to be a dislocation of a massive portion of the vein of about 5 feet, which brings a less completely silicified portion of the vein opposite the solid quartz.

Q. Well, that is an occurrence down there similar to what you say occurred up in the neighborhood of the junction of these two veins?

A. Well, no, this is a later fault.

Q. Well, I mean similar as to process?

A. This is a later fault. There has not been any quartz deposited along this fault that I have observed.

Q. You do not think, then, that the conditions shown in the neighborhood of that particular fault you have just testified to are parellel at all along the line of the intersection between these other two veins with reference to silicification?

456 A. No sir.

Q. Is there any displacement there which indicates the extent of the displacement on that fault plane?

A. Yes. I have already answered that question; I stated that there appeared to be a displacement of about 5 feet, which brought a portion of the solid quartz up opposite vein material which is not so completely silicified.

Q. Then, that indicates that they are of a different origin as to period? The more highly silicified quartz formed at one time, and the other part of the fault at another?

A. No.

Q. What does it indicate? Please explain it?

A. That indicated that the ground was unevenly impregnated with quartz, and at that point we have a portion of the solid quartz brought up against that which was not completely turned into quartz.

Q. Just as a matter of coincidence at that point, the line of demarkation occurred? That is to say, the difference in character of the structure?

A. It occurred there because there was a fault there which shows the difference on the two sides.

Q. Was that a pre-mineral or a post-mineral fault?

A. That is a post-mineral fault.

Q. Then, you do not understand if you should place the parts as they were originally that there would be any change in the structure? If you put that back, the dislocated part, unite the two, there would be any difference in the structure? The difference would still be observable?

457 A. The difference would still be observable; instead of being in a horizontal direction, it would be in a vertical direction.

Q. The difference in structure would still be observable?

A. That is due to the difference in the degree of silicification.

Q. It was a part of the same thing at that time, according to your judgment?

A. Yes sir.

Q. And the mineralization was here faulted?

A. Yes sir.

Q. What produced the difference in structure that exists now?

A. The difference in solubility of the rock which has been re-

placed by the quartz. The difference in the amount of the crushing which it had sustained.

Q. In other words, what was the same thing, the same general composition at one time has been changed and modified by subsequent movement and subsequent action of different kinds?

A. We find throughout all of these veins quartz which is completely crystallized. We find other portions of the veins which contain fragments of the country rock turned into lighter or darker colored quartz, but with the rock texture still observable. And we find in still other places fragments of country rock included in the vein which is but little silicified. That enables us to perceive a gradation in the extent of the quartz deposition.

458 Q. Well, that is a very interesting explanation, but I am not sure that I have made myself clear; if you will permit me to just go over that question just once more; if you will permit me to give you an illustration in a crude sort of a way, because I do not profess to be a scientific man, Mr. Winchell. I have here a section of vein—we will mark this, if you please, "Winchell X 5"—which was formed at the same time under the same conditions, it is impressed with the same indicia and has the same characteristics as to structure and as to component matter generally. That is your idea as to the original condition of that vein at that point that you just testified to in that raise, is that correct, where that fault is? That was the original condition of homogeneous, the same character of filling of the vein?

A. No sir, I said it was not.

Q. Not in the original instance?

A. No, there were different degrees of silicification of the material included in the original vein.

Q. And the fault line——

A. It was all vein.

Q. It was all vein?

A. But some of it was harder quartz than others. And at this particular point there has been a little faulting, which brings some of that hard quartz against some of the less completely silicified vein matter.

Q. Then, you did not intend to say that the faulting of that vein so that a part of it was thrown down has changed the structure, or did you?

A. No, I did not.

459 Q. It is the same thing precisely as it was when it was in its original position, so far as structure and quality and mineral aggregations, or whatever you might call them, the same thing?

A. Yes, I see no indications of mineralization later than that fault to which I referred.

Q. Then, the faulted segment, if put back in its original place, would match directly up with it, and show the original condition?

A. I presume so.

Q. You presume so?

A. Yes sir.

Q. Then, that was simply a mere coincidence, then, that the fault

happened just at that place where there was a line of demarkation between the character of the quartz?

A. No, there was not a line of demarkation. The line of demarkation was made by the fault.

Q. Then, you could not tell the lower part from the upper part before the fault was made?

A. Probably not.

Mr. Lindley: I misunderstood your explanation, then. Put a rubber band around that, and mark that "Five X."

Mr. Alling: Judge Lindley, for my own information, this has all been about this little fault out here at right angles to the axis of the so-called roll, has it not?

Mr. Lindley: That is where he said there was a displacement which is not shown on the model, but which he recalled as being about how far?

The Witness: About 5 feet. It is not a displacement of
460 the entire vein. It is a displacement which marks the moving of one part of the vein up or down against another portion of the same vein.

Q. Well, you mean by that, that the displacement did not extend clear across the vein?

A. No, I do not mean that. I mean that the vein was not moved along the fault far enough to displace it entirely. The fault passed through the vein.

Q. Is that on account of the width of the vein?

A. Yes sir.

Q. Then, the movement was not as great as the width of the vein?

A. It was not. That is a better way to put it.

Mr. Lindley: Well, I think perhaps if it is the pleasure of the Court, we will adjourn. I think that I am pretty nearly through with Mr. Winchell.

Mr. Dickson: If you do not object, lest we forget, I want to make a general offer in evidence of all our exhibits, all our maps.

Mr. Lindley: That goes without saying, certainly. We consider that whenever a witness is examined and an exhibit of any kind is identified by the witness, it is considered to be in evidence in connection with the testimony of the witness, and that may extend through the trial.

Mr. Dickson: Very well.

The Court: This case is continued until 2 o'clock this afternoon.

461 December 12th, 1914—two o'clock p. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

HORACE V. WINCHELL on the stand for further cross-examination.

Mr. Lindley:

Q. Mr. Winchell, I am going to ask you to be kind enough to

give us your understanding of the occurrences in the cross cut, which is on the blackboard, marked "Win. X-6"; that purports to be a cross section through that portion of the mine which has the stopes at the west end of the property, in the neighborhood of Raise-A; can you identify the workings that are marked there on that "Winchell No. 6."

A. Raise-A, I take it does not show on the section.

Q. No. In other words I understand it that there is nothing shown on that section, but actually occurred in the plane of the section,—it does show, yes. The 200 Raise is identical with it?

A. Yes, but Raise-B does not show on it.

Q. That is a vertical raise?

A. Yes.

Q. Well, if Raise-B is essential later on to help you out any you may indicate that on there, but I would like for you to give me now the quartz occurring in that roll, or juncture of the two veins, as you call it, and roll as I call it; just take your lead pencil and give us the quartz?

A. May I ask you if this little working indicated by the letters R. S. E. is Raise 132? It is not numbered here.

Q. I think that is the raise, is it not Mr. Finch?

Mr. Finch: Yes.

462 Mr. Lindley:

Q. You can mark it on there to identify it.

A. It is not necessary as long as I understand it. It is not an easy matter to construct a section off-hand like this but I will do the best that I can.

Q. Well, you are quite familiar with that ground, are you not?

A. I am familiar with the workings that are open, yes.

Q. That has been quite a battle ground in this case, has it not?

A. Yes.

Q. Therefore you have made more especial study of it?

A. I have. I should say that that represents in general the situation (indicating). The section is taken diagonally through the strike of one of the veins and nearly on the dip of the other, consequently they cannot both be represented in their true relations. The A-raise shows the hanging wall of the north dipping vein throughout, and therefore must show it where intercepted by this line of section. Raise-152 starts upward upon the vein but does not follow the vein to its top, because it enters the cap and I am not quite certain whether at this particular plane of section the quartz shows at the bottom of raise 152, or not.

Q. May I ask you at this juncture whether you think the vein exposed in Raise-A is also exposed in Raise 152?

A. It is possibly, although I am not sure of that; the cap shows in that raise and underneath the cap is a little quartz. The raise upon this section should be marked mostly in green as I have now indicated, marking the cap.

Q. Well, I understand that you don't wish to determine now

whether raise-A will show the same condition when it reaches, if it does reach raise 152?

463 A. I do not know.

Q. What is your view about it?

A. Well in a country so full of faults, faults so numerous as they are in the vicinity of this cap, I should not like to express an opinion.

464 Q. Now, have you omitted anything from this section, Mr. Winchell, that was not put on there that was put on the other section in reference to the designation of walls, gouge and things of that kind?

A. No, I think not.

Q. How about the gouge on the south dipping vein in this section?

A. There is not a very good gouge there. In fact, it is less noticeable there than usually over the south dipping vein.

Q. Did you observe any gouge there at all?

A. That is at the top of a st*poe*——

Q. May you not answer the question categorically and then explain?

A. Pardon me. I do not recall observing any gouge there.

Q. Well, do you find any similar conditions there as to structure, anything parallel to the conditions down in these cross sections that were represented by Winchell 1 and 4—Winchell's cross?

A. Yes, we observe the hanging wall of the north dipping vein continues along the top of the stope of the north dipping vein, and extending upward beyond it, and shown in A raise.

Q. But you have shown a gouge, hanging wall in the other two sections in the south dipping vein?

A. I have already explained that sometimes that wall is to be seen and other times it is not noticeable. That the hanging wall of the south dipping vein is sometimes quite completely cemented by silica.

465 Q. Is there any defined foot wall shown in raise A?

A. No.

Q. What do you conceive to be the character of the material underneath the bottom of raise A, between that and the top of the West End—top of raise shown on the south dipping vein?

A. I believe that to be trachyte.

Q. Unmineralized, either geologically or in a miner's sense?

A. Probably considerably silicified.

Q. Well, when you use that——

A. I do not call it mineralized in the sense that it has ore in it.

Q. In the geological sense, is it mineralized?

A. It is silicified, yes.

Q. But not in a miner's sense?

A. Not in a miner's sense.

Q. When you speak of the mineralization, almost everything is mineral, isn't it, that exists, either in the air or in the earth or underneath it?

A. Well, any inorganic substance may be mineral.

Q. Well, water is a mineral, isn't it?

A. Yes.
Q. So is petroleum?
A. It is.
Q. So is gas?
A. Yes sir.
Q. When you speak of the term mineralization with reference to these veins——
A. Some kinds of gases are mineral. Excuse me.
Q. That depends upon their original source. Is that what you have reference to?
466 A. No, meant that there are some organic gases.
Q. Well, have you examined the intervening territory there between the bottom of raise A and the raise going up on the south dipping vein to determine whether it is ore, or whether it is mineralized in the miner's sense?
A. It is not accessible. Not been opened up by development.
Q. Then, you do not know?
A. You asked me my opinion and I gave it to you as probably trachyte.
Q. Of course, you can not see any further than any one else can up against the rock?
A. I thought if I had said that first you would ask me for my opinion. Therefore I gave it to you first.
Q. There is no development there to show what is below the bottom of that A raise, is there?
A. I think not.
Q. And there is no hanging wall developed from the raise on the south dipping vein?

Mr. Dickson: You say below the bottom of A raise. The bottom of the raise goes into the stope.
Mr. Lindley: The bottom of the raise—the raise would have a top and bottom. The top of the raise is indicated by a gouge line indicated in blue. The bottom of your raise is indicated in quartz.
Mr. Dickson: I see what you mean.

Mr. Lindley:

(Q.) Now, the bottom of that raise is not along a wall?
A. No, it is not.
Q. What you have designated as quartz?
A. It is in quartz.
467 Q. You do not know how far below that quartz extends, as a matter of fact?
A. I do not, but I have never seen the north dipping vein of very great thickness, and in order to extend all the way downward to the south dipping vein at this point, it would have to have a thickness of more than 20 feet, more than possibly 30 feet.
Q. Are there not some stopes in the mine that are that width?
A. On the south dipping vein, there are.
Q. What is the maximum width of the stopes in the north dipping vein? You have not observed, I suppose, all the stopes that have been made in that vein?

A. No, I have not.

Q. Well, from your experience, what is it?

A. 6, 7 feet. The maximum, I should say, was not over 8 feet in thickness.

Q. Well, you think that the variation in size of the stopes, then, is indicative of different origin and different vein?

A. To a certain extent.

Q. To a certain extent. Now, with reference to this upraise, I think it is 195, isn't it? Is that the way you identified that raise, 195—supposing you should determine that raise A followed over and connected with, in the same class of material which is shown in the cross section, with raise 152; that is the raise 152?

A. This is 152.

Q. Yes. And the drift from the top of the raise. Suppose it should be shown that what is stoped in raise A connects with, and has developed in raise 152. Would that be at all significant
468 of anything, in your judgment?

A. It would not be at all significant of any facts which would change my opinion, that I have already expressed, in the least.

Q. Then, you think it is entirely immaterial?

A. I think it quite likely that the quartz found in raise A may extend a little farther until it lies under the contact of the cap in raise 152, at a still higher distance above the south dipping vein.

Q. That raise A down as far as the gouge seen might be traced?

A. No, the hanging wall is visible in the top of the raise.

Q. That is to say, from your observation there that gouge extends further into the hanging, further to the south?

A. I think it does, yes.

Q. Pretty close to the cap rock there?

A. Yes, sir.

Q. Do you understand, Mr. Winchell, that there is a difference between a miner's vein and a geologist's vein?

A. Well, miners have a very varied conception of what is a vein. I have seen many a miner locate an aplite dike for vein. I think that the ordinary conception of a vein is understood by both. I should say that the proper conception of a vein, whether miners' or geologists', is a deposit of mineral, or mineral bearing rock within boundaries, in place, and possessing such indications of value as to justify the miner in following it in the pursuit of ore.

469 Q. Speaking of boundaries, do you mean physical lines of demarcation?

A. Not necessarily.

Q. They may fade out into country rock?

A. Well, boundaries, may be commercial or physical as well as——

Q. That may be determined by an assay value?

A. It may be, but the boundary must be there.

Q. Well, we may draw a distinction mentally I suppose, between a physical line of demarcation as a gouge wall and a fading of values into the country rock?

A. I think so, yes.

Q. Wall boundary, the vein boundary, the vein limitations would be the limit of pay values?

A. It is often in veins which I have seen.

Q. Consequently when you speak of boundaries you do not mean necessarily physical boundaries?

A. No, I do not.

Q. Now we have discussed to some extent in this case the Fraction vein and what we call the south branch of the south vein. Are either of those veins,—are there any occurrences exhibited on those two veins,—let us take up the Fraction first, if you please, that are essential at all for the determination of any of the facts in this case?

A. Not essential, but having a side light upon the nature of the south dipping vein, as to whether it is a contact vein, as you have called it, or a fissure vein.

Q. Well, all the veins involved in this controversy are classified by you as fissure veins?

A. They are.

Q. And why should there be any distinction, as far as that is concerned, in the Fraction vein and the other veins; I am
470 anxious to get from you if you feel disposed to tell me, and if you feel that you have sufficient facts to detail them, what function the Fraction vein cuts in the determination of the issues that we are trying to try here?

A. I am not attempting to describe the Fraction vein, as one of the important, vital, Geological phenomena in this case. I called attention to it because it is of the same fissure system as the south dipping vein, and unites with it upon strike and dip, and because it lies entirely within trachyte upon both its hanging and foot walls.

Q. Have you undertaken to trace the course of the top of that vein?

A. I have not undertaken to trace the course of the top; we have the top substantially developed at two points within the West End ground.

Q. Was it developed sufficiently to show whether the top crossed the side line or end line?

A. Yes, sir.

Q. What is your deduction in that regard?

A. It crosses the south side line of the West End claim a few feet westerly from the southeast corner of that claim.

Q. In other words it crosses the side line?

A. It does, and extends westerly for several hundred feet within the West End claim.

Q. And terminates against anything?

A. Unites westerly with the south dipping vein, as I believe at the present moment on the 400 level it approaches nearest; there, is a wedge of cap cutting down below the level and obscuring this point of union;

Q. On its upward extension does it terminate within the West End ground?

A. It does.

471 Q. Against what?
A. Against the cap rock.
Q. Against the cap rock?
A. Yes.
Q. Are you sufficiently familiar with the south vein. that we call the south branch of the south dipping vein, that is in the vernacular of the case, I may say that we call it the south vein,—are you sufficiently familiar with that vein to determine the source of its top or apex?
A. Only inferentially; we have the strike of it below the top and we have its dip and we have it at the top at one point; therefore we can show approximately the direction.
Q. What is your judgment about it from the observed facts?
A. What is what?
Q. What is your judgment about the position of that tracing of your top or apex of the south vein, with reference to the side or end lines of the West End?
A. The top or apex of the south branch of the south vein lies within the West End claim, its direction is north 50 degrees east approximately and its dip is to the south until it unites with the main West End or south dipping vein.
Q. And on its dip?
A. On its dip.
Q. That union occurs in West End territory before it reaches the side line?
A. No it does not, not throughout its extent.
Q. What is your conception of the course of that apex or top of the south vein, with reference to the West End south side line?
A. In a general way it is parallel, although it strikes a little more to the northeast.
Q. Parallel with what?
A. With the south side line of the West End claim regarding which you interrogated me.
472 Q. You do not think that it crosses the south side line?
A. The apex of the south branch of the south dipping vein?
Q. Yes.
A. I do not.
Q. Does it cross the end line?
A. I think it does not cross either end line.

Mr. Lindley: Take the witness.

Redirect examination.

Mr. Dickson:

Q. As I understand you, Mr. Winchell, every vein must have boundaries, but not necessarily boundaries that can be seen?
A. That is my understanding.
Q. It may be determinable by assay?
A. Yes.
Q. As I understand both the north dipping vein and the south

dipping vein,—I mean the north dipping vein has a well defined hanging wall?

A. It has.

Q. And an illy defined foot wall boundary?

A. Yes.

Q. The foot wall country having been replaced or impregnated with mineralization?

A. That is in accordance with my observation.

Q. And how about this hanging wall of the south dipping vein; is that a pretty well defined wall?

A. It is a wall that is not so well defined as that in the north dipping vein; the hanging wall is however better defined than the foot wall, referring now to the south dipping vein.

Q. The limit or boundary of the foot wall, the foot wall boundary there, is where the mineralization ceased, the replacement
473 ceased.

Mr. Lindley: If you will permit the interruption I would like to have the witness point out on the model the place where this last cross section appears.

Mr. Dickson: Certainly.

Mr. Lindley: I did that with the other cross sections but I omitted to do so with this. I am referring now Mr. Winchell to "Win.-6" will you point out on the model where that cross section is?

A. That cross section appears to be taken in a general northerly direction through the top of A-Raise and passing near the foot of B-Raise, and crossing through raise 152, as I now hold my pencil.

Mr. Lindley: That is all.

Mr. Dickson:

Q. What is the course or direction of the dip of the north dipping vein where cut by this plane or section, and what is the dip of the south dipping vein where cut by that section?

A. The dip of the north dipping vein as cut by that section is northeasterly and the dip of the south dipping vein on the same section is southeasterly.

Q. I wish to call your attention one moment,—it may not be redirect, but only a question or two,—to the raises going up from the south dipping vein in there,—you give me those numbers.

A. 569, 571, 573, 575.

Q. Have you observed the thickness of the quartz in the south dipping vein where those several raises go up at the line of juncture, with the north dipping vein?

A. I have.

474 Q. And about what is it where each of those raises go up?

A. From fifteen to thirty feet in thickness.

Q. Have you observed the thickness or the height of the stopes

in the south dipping vein, as shown upon this model above which raises 2-A; 4-A; 5-A; 6-A and 7-A are driven up?

A. I have.

Q. And about what is the height of the stopes in the south dipping vein at the bottom of those raises?

A. You mean by the height of the stope,——

Q. The thickness of the vein?

A. The thickness of the vein?

Q. Yes.

A. There are two stopes, one overlying the other at this point, making the total thickness of the south dipping vein more than forty feet at the maximum.

Q. And that is—is that the thickness in round numbers at the plane or line of the juncture of the two veins?

A. That is the thickness of the south dipping vein, about where it meet- and terminates against the north dipping vein.

Q. You spoke in cross examination, as well as in direct of some place or places where, according to your observation, the south dipping vein cut into the quartz of the north dipping vein, which you explained was due to a movement, easterly movement of the north dipping vein. I wish you would, if you can now give a list of the places where that is most observable? I think you said already 569 raise?

A. No, there is a clean cut-off at 569 raise.

Q. Well, go to the places where you have the——

A. That can be seen in raise 573. It can also be seen near the foot of raise 4-A, and to a slight extent at the bottom of 5-A and 6-A.

Q. It is not observable throughout?

475 A. It is not, in some places the quartz of the south dipping vein is shattered and crushed, and it has not had the resistant qualities which enabled it to penetrate into the quartz of the north dipping vein.

Q. Calling your attention to "Winchell X-1" sketch, I understand you to say that there is quartz in the floor of that cross cut beneath which Mr. Lindley has placed the letters "X and Y."

A. Yes, sir.

Q. Are there any developments, workings, near that section to enable you, or anyone, to determine how far beneath the floor of that cross cut the quartz extends downward?

A. No, there are not. Further to the west, similar quartz can be observed more than one hundred feet below the line of meeting of the two veins.

Q. And do you think that is vein quartz to that depth——

Mr. Lindley: Ask him what he thinks, Judge. He is your witness.

Mr. Dickson: You won't object to the question if you hear the whole of it.

Q. Do you think that at the depth of a hundred feet it is still vein quartz, or that it is the silica which you referred to in your

direct examination as having penetrated the rocks before the opening of the fissures?

A. It is quartz like that which is contained in the veins, but it is not mineralized, and it was probably deposited in the rocks before the formation of either the north dipping or the south dipping veins.

Q. Is it true, also, of "Winchell X-4" that in that cross-cut running from the south dipping vein to the north dipping vein as shown in that section that you have quartz in the floor of that cross cut?

476 A. I have not examined it particularly, but it is my impression that there is.

Q. You were interrogated at some length, and with some care, about the fault or a fault which is disclosed in what is marked on the model "W-373"?

A. 573.

Q. 573. That is for winze 573 I take it?

A. Yes, sir.

Q. You have also stated that the north dipping vein is a fault fissure or on a fault plane?

A. I have so stated, and I suggested at one time the name Polaris Fault Vein for this vein.

Q. For the north dipping vein?

A. Yes, sir.

Q. Now, the fault about which you were interrogated at length and just referred to as being at winze 573, the course of that is what, with reference to the course of the fault fissure, fault plane, in which the north dipping vein lies?

A. The fault is nearly vertical and the north dipping vein, has a flat dip, relatively flat dip to the north, therefore they cross each other at an abrupt angle.

Q. And, the strike of the two is very different?

A. Quite different.

Q. How close to the cap rock do the workings extend on this "Winchell X-1" sketch?

A. The cap rock shows in the top of raise 488.

Q. And the gouge which you spoke of on the hanging wall of the north dipping vein, as I understand that gouge is not above the vein, immediately above the ore and below the wall rock?

A. It lies between the quartz and the overlying country rock.

Mr. Dickson: Unless we overlooked something, if your Honor please, the Defendant rests its case in chief.

477 Recross-examination.

Mr. Lindley:

Q. I do not know whether it is important or not, but I would like to straighten myself out on this silicification that you say exists there without being mineralized, before the formation of either vein?

A. Yes, sir.

Q. Well, is this silicification that you refer to in this particular instance the natural component of the rocks itself, of the rock itself, or is it the result of a deposition of siliceous waters flowing through the ground?

A. It is the result of uprising siliceous solutions depositing quartz in the country to a very large extent. The structure of the vein, the north dipping vein, can be seen cutting directly across and through this original early formed quartz.

Q. Then there must have been other openings in this ground before either vein was formed, which caused this silicification?

A. I so described them in my testimony in chief.

Q. That is your understanding that this country was fissured before either vein was formed?

A. Yes, in a north and south direction.

Q. Leaving openings for the penetrations of these siliceous solutions that came up? What is your idea about the source of the mineralization, is it a kind of lateral secretion or is it ascending waters?

A. Ascending waters.

Q. It is not a case of lateral secretion out of the country rock?

A. No, not in a limited sense.

Q. All of this mineralization, speaking of it now in a miner's sense is due to ascending waters from the heated depths below?

478 A. Yes, sir.

Q. And there is no suggestion of secretion or a solution revolving of minerals in the adjacent rocks, and penetrating those different crevices?

A. No, I have not seen it.

Q. Referring to 573 Raise, if you should be informed that the quartz in the bottom of this raise which you describe as not connected with the vein should contain ore values, would your judgment be different?

A. No; I have already stated that I believe that in connection with the formation of the north dipping vein there was a considerable silicification and, in some instances a mineralization of the crushed rock in the wedge which lies immediately underneath the intersection of the two.

Q. And you do not pretend to say from which source it came, being deep seated sources in the original instance, whether it came from the south dipping or north dipping vein or both?

A. My opinion would be that the mineralization extending throughout this crest would probably have been derived from the north dipping vein.

Q. Well, that is your opinion?

A. That is my opinion.

Mr. Lindley: That is all Mr. Winchell.

The Court:

Q. Mr. Winchell, referring to the exhibit "Winchell X-6" did you find any distinct line against which the south dipping vein abuts?

A. Not in that territory. The ground is very much shattered and the quartz up 7-A raise is not typically continuous vein quartz as can be seen in 4-A; 5-A and 2-A, but it is very much broken. The only continuous structure there is the hanging wall.

Q. That section refers to Raise-A, doesn't it, in the western territory?

A. Yes, sir.

479 Q. And that answer would apply there?

A. That is what I understood you.

Q. You said 7-A.

A. Oh, yes, I mis-spoke. I referred to 200 A-raise, the A-raise as we call it.

The Court: That is all.

The Witness: My answer should not have referred to 7-A.

Mr. Lindley: May we adjourn now, to open the case for the plaintiff on Monday morning at ten o'clock?

Mr. Dickson: That is agreeable to our side.

Mr. Lindley: We should like to have you gentlemen place your exhibits at convenient reach, because we have a number of models.

Mr. Dickson: I would like to have this model especially for cross-examination, if I desire to call the attention of your witnesses to it.

Mr. Lindley: Anyway we will accommodate ourselves. I do not think Judge Dickson, you will find any difference between the two models, except possibly the coloring, if we had known the colors that you gentlemen adopted, we would have adopted them upon our model. If you think that it is necessary to compare the two of course they ought to be in reach. They should be placed within reachable distance, but we have several models and we would like to stage them all at once.

Mr. Dickson: There is one thing that we may discuss, maybe out of court, as well as here: Night before last your client requested some additional work to be done.

Mr. Lindley: Yes, sir.

Mr. Dickson: That is being prosecuted. To-day we have been requested to do two additional pieces of work, and there ought to be sometime when this would stop, because it might be necessary, in the light of what might be disclosed by some of the work that we would do at your request, to have additional time to do other work before the case closes. We are willing to go ahead and do the two pieces that you suggested to day, but may we understand that that will be the last?

480

Mr. Lindley: Well, I will simply say this, Judge Dickson, in that behalf, what we are trying to arrive at is the truth.

Mr. Dickson: Surely, both sides want the same chance.

Mr. Lindley: And anything that would tend to establish the truth we must have. I do not apprehend that there is anything farther. These things are brought out from the examination of the witnesses and suggest things that ought to be done to negative the testimony of the witnesses and if it is necessary to establish the truth, if at any time in the course of our case you wish to suggest that

something be done which you think would develop the truth, you must have time to do it. I do not wish to cut this thing off on an arbitrary proposition. I was in the trial of a case once that consumed eight weeks and on the last day of the trial, and the last minute a disclosure was made which we considered tremendously important.

Mr. Dickson: I take it that, as at present advised you have no additional work.

Mr. Lindley: Not that I know of Judge Dickson.

The Court: This case is continued until Monday morning at ten o'clock.

(Adjournment taken until Monday December 14th. 1914, at ten o'clock a. m.)

481 11.

Monday, December 14th, 1914—10 o'clock a. m.

The Court: Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Mr. Lindley: May it please the Court, it is my privilege and pleasure to resume the thread of this course, so far as the Plaintiff in this case is concerned. I have always believed in trials of cases of this character that both the Court and the opposing Counsel should be permitted to view the case as it is about to be presented in its lights and shadows, not approaching an argument upon the merits, but a statement of the facts, with sufficient detail to give to the Court a fair understanding of the situation from the view point of the party presenting the case, in order that the testimony, as it follows, may be clearly apprehended, and exercising a similar function so far as the Counsel upon the other side is concerned.

Cases of this kind require some considerable preparation, and the net result as produced before this Court on the hearing of these cases represents many months of hard labor. It is quite impractical in an opening statement to go through serious detail, but general high lines and outlines of the case, structurally and legally, I think should be presented, and with your Honor's permission, and with the indulgence of Counsel upon the other side, I will state the views of the Plaintiff as to what the vein in controversy is, from our conception, and what the facts as they are developed in the ground determine as an ultimate deduction at the time as to the nature,
482 extent, character and habits of this vein, together with its genesis, the manner in which it was formed and subsequent actions of nature which have modified the conditions presented to the eye in the form of models, as they are submitted here to your Honor, our conception of what the truth is.

In defining the geological conditions, I am reminded that it is important that I should be succinct, at the same time definite, if the statement is to be of any advantage to either the Court or the opposing Counsel, and therefore, with your Honor's permission, I will refer to my notes here wherein is embodied our conception of this vein from a geological viewpoint.

What is known as the West End MacNamara vein, which is to some extent involved in this controversy, has an area greater than that of any other vein in the Tonopah district. The development on it is extensive. It extends in an easterly direction through the properties of the prominent mining companies of the district. Also over the easterly portion of the West End claim it has been developed in a northerly direction through the MacNamara, Tonopah Extension, and for a long distance into the property of the Tonopah Mining Company.

In a southerly direction it has also been developed and ore has been extracted from it for 600 feet, or thereabouts, into the property of the Jim Butler Company.

This vein is essentially a contact vein. It has been known as such in the Tonopah District for years. It is commonly known as the upper contact vein, in contradistinction to what is known as the lower contact vein.

483 It lies at the bottom of the Mizpah trachyte, formerly known as the earlier andesite, and between this rock and the various rock formations which underlie it, except locally where due to irregularities of the contact of the Mizpah trachyte and the underlying rocks, it has cut across the Mizpah trachyte, leaving comparatively small masses of the Mizpah trachyte on its footwall side. Genetically, this vein, as most of the other veins of the district, is definitely associated with the Mizpah trachyte, which is popularly known as the lode porphyry of Tonopah. It is in this rock that most of the productive mines of the district have been developed.

While it is essentially a contact vein, in a broad sense it may also be considered as a fissure vein, the fissure having been controlled in its form and position by the contact as a plane of weakness. And — has already been expressed by the witnesses of the Defendant, before mineralization, it was a zone of fractured rocks, and on account of its nature as a zone of fracture, as distinguished from a definite fissure, was probably not the result of extensive dislocation of the rocks.

The testimony of the Plaintiff will show that the vein at all points where it is observable, whether in the MacNamara, the West End, or the Jim Butler properties, is of precisely this character. And a quartz deposit bearing precious minerals filling and replacing a fractured zone of rock and extending outward along seams into the overlying solid trachyte, as well as into the rocks of the footwall.

484 Certain raises and other workings have been driven from the hanging wall side of the vein, and the gradual diminution of the quartz deposit outward into the barren country rock has been clearly and thoroughly developed. We expect the testimony of the Plaintiff to show that this fissure zone of fractured rocks filled and replaced by quartz and ore minerals, passes into its *the* areal development along the contact mentioned over a roll or anticline the crest of which lies for a portion of its extent within the limits of the West End plane. This anticlinal roll is clear, an accentuated case of a character-stic undulating or rolling habit of the vein. This roll, which pitches in an easterly direction, has been characterized by the Defendant as the line of meeting of two separate

veins. It will be shown by the evidence that the ore, mineralized *structe,* and the size of this vein is similar on the two slopes below the crest of this roll. For similar areas the roll on the opposite sides of the crest below, a similar amount of stopeing, has been done on the south in the west end, and on the north in the MacNamara, although at the time when the MacNamara stopeing was done, conditions made it necessary to limit the stopeing to the higher grade than has been necessary in the operation of the West End Company.

Some of the stopeing done in the early days by the MacNamara Company passed over the crest continuously and was of an identical character, without an interruption or break across the summit or crest.

Similar stopes have been made by the West End Company at points where the crest of this region of the vein lies within the West End Claim, stopes which have passed over the summit of the
485 ridge and downward in its northerly slope. Developments made in connection with this case as shown at many points, continuity of the vein over the roll and downward toward the north. In the immediately adjacent territory of the Tonopah Mining Company to the east, both slopes of the roll have been developed and the vein has been found to be of precisely the same character in both instance-.

In the geological history of the region, after the formation of this vein, with its character-stic undulations, the region was subjected to long continued erosions, developing a surface of pronounced relief in the Mizpah trachyte. Upon this surface of erosion, there was extruded a lava known as the Midway andesite, which varied the outcropping edges of the veins in the lode porphyry.

The extrusion of the Midway andesite was followed by another period of erosion, and as the result of this later erosion, not only was the Midway andesite in a large part removed, but a south westerly slope or hillside is evolved which, in part, underlies the western portion of the West End claim. On part of this eroded slope, the West End MacNamara vein appeared as an outcrop, so that had the region been examined by any prospector at that time, he would undoubtedly have adopted the outcropping of the vein as the lode line of his claim. The out crop of the vein would have presented the usual features of surface outcrop in the breaking down of the quartz, its superficial oxidization, and the development of float down the slope.

The surface on which this outcrop of the vein appeared was
486 at a subsequent time buried by an eruption of volcanic agglomerate and ashes called the Fraction dacite Breccia, which, I understand is our term for the term used by Mr. Winchell the Brough Mountain dacite breccia, from some volcano, the site of which is unknown.

This volcanic agglomerate near its base and in the vicinity of the buried outcrop contains fragments of quartz derived from the vein itself. This buried surface can be clearly seen at several places in the underground workings and its configuration can be*en* very satisfactorily constructed, as has been done in an illustrative model,

which will be offered in evidence, and which, for the purpose of illustration at this point, I desire to exhibit to your Honor.

The original outcrop, before it was buried by the later flow, as delineated at the west end property, the lines of the West End claim are laid over it, and the vein as it existed at that time, prior to the later eruptive rocks which poured out and covered it to form the surface outcrop of the vein. It will be readily seen that the position of the outcrop is directly across the side lines in the West End claim. This model has additional parts, showing the overlying rocks, and from which the witnesses will explain to the Court the sequence in which these rocks were laid down and the occurrence, as I have explained. This buried outcrop or apex of the vein
487 is the top edge of the vein, and is the only edge of the vein that appears anywhere, either at or beneath the surface of any of the claims involved in this dispute. The testimony will show that there is not a terminal edge or any edge of the vein along the crest of the roll or anticline which extends from the western portion of the McNamara, easterly through the West End Claim, but there is an apex or terminal edge crossing the sidelines.

At a time much later than the formation of the vein, later than the first period of erosion, later than the extrusion of the Midway andesite and later even than the second period of erosion and subsequent eruption of the fraction dacite breccia, the region was affected by stresses which resulted in the flat, trough-like fault, dipping in general Northeasterly and for a small portion of its course tangent to the anticlinal roll of the vein along its summit and cutting through the country rocks overlying the vein to the north. It has been upon this fault that nearly all of the litigation work of the Defendant has been done. This fault is also the gouge which has been referred to by Defendant's witnesses as the hanging wall of the north dipping vein. Because of its very probable correlation with the large fault in the Tonopah Mining Company's ground referred to by Mr. Spurr as the Siebert fault, this gouge will be referred to by that name. The movement on the Siebert fault was different in direction from that of the original vein fissure. Defendant's witnesses testified that there is a different- in the character of the hanging wall of the West End-MacNamara vein on its northward slope into the MacNamara territory and its southward slope in the West End. The evidence of Plaintiff will show that there is no difference in the hanging wall of the vein at these various points except as caused
488 by the Siebert fault, which although it coincides approximately with the hanging wall of the vein for a very limited portion of its extent, as above stated, is later than all the mineral contents of the vein and the cap rocks which overlie it and therefore does not constitute a part of the vein. It will be shown in the MacNamara workings, as in the West End workings, where the Siebert fault is not present, penetration of the rocks overlying the vein by vein mineral is identical up to the plane of the fault, where the fault lies at a distance above the main body of the vein. The litigation raises of the Defendant have developed a special condition of the Siebert fault tangent to the hanging wall of the main mass of the

vein at the point where it changes from a northerly to a southerly dip and have shown the fault extending upward to the south through a mass of interlacing stringers, which exist here, as elsewhere as a border zone above the main body of quartz and into the overlying cap rocks. Even if the further evidence of the Siebert fault were lacking from the fact that it cuts into and dislocates the cap rocks, the litigation raises of the Defendant show in themselves that the quartz found in them is not of the same age as the fault, but that this quartz is instead crushed and cut off and does not conform with the gouge of the fault followed by the raises.

This in brief is the outline of the genesis and structure of these veins from the viewpoint of the Plaintiff. In order to exhibit these matters to the Court we have prepared, as I stated in the beginning, numerous maps and models, the main working map which will be marked as "Plaintiff's Exhibit 1," purporting to represent all of the underground workings of both mines, and also of such as are available in the MacNamara, some in the adjoining mines, and were made from actual surveys and represent in horizontal plane these underground workings.

Plaintiff's Exhibit 2 is a model constructed on the same scale as that presented by the Defendant, and so far as mechanical representation upon the model is concerned—that is to say the openings the models represent—I think that they practically correspond
489 with the models presented by the defendant in the case.

The color scheme upon plaintiff's exhibit-2 however has been modified from that adopted by the defendant in the case, because, first we did not know what their color scheme was, and, in the next place we have assumed an arbitrary color to represent different things, and these will all be spoken of and explained in detail by the witnesses upon the stand.

There are some small details in geology and numbering and we have endeavored to follow*ing* the numbering of the defendant in this case, so as to avoid possible confusion. There is also the glass model which represents a series of vertical glass sheets in which we have delineated lines of faulting, lines of the planes, and I will state that the sections shown on these sheets are identified on the main map by their numbers commencing with zero at the extreme east end, and following along in a series of numbers up to number thirteen.

These cross sections are taken, I understand at distinct intervals and are our results *is* illustrated upon the glass model. There will also be introduced in connection with the testimony of the various witnesses, who have made a study of these underground conditions, other cross sections and other illustrations, which are entirely unnecessary to refer to at this time. The two principal models, together with the model which I alluded to in my argument, this is marked as Plaintiff's Exhibit No. 4, represent substantially the models that will be used in the progress of the case. So much for the questions of fact.

I would be permitted at this time,—and I think it is quite proper to state what I consider to be the legal postulates that will occur necessarily from the conditions exposed here, and I have in-

490 dulged in *a* certain hypothetical conditions, which may be classed and discussed very briefly under the subject of legal postulates.

The right to pursue a vein on its downward course, out of and beyond a vertical plane drawn through the sidelines into and underneath the lines adjoining,—when this right exists to any degree, can only be exercised to the extent that the top or apex of the located vein is found within the surface boundaries of the location, or within the vertical planes drawn through them. A common definition of an apex may be noted. The apex is all that portion of the terminal edge of the vein to which the vein has extension downward in the direction of the dip. This definition involves the element of terminal edge and downward course. Where the terminal edge from which there is a course downward appeared at the surface in the form of an outcrop, this outcrop constituted the apex, and in this sense the term is synonymous with outcrop. Where the terminal edge from which there is a downward course is covered with the cap, the plane of contact and the cap constitute the apex. The course or flow of an anticline vein is not an apex. As it is our contention that this vein is one vein and its form is anticlinal, there is no terminal edge along the axis of the anticlinal, which can be deemed to be the terminal edge. The vein dips in both directions from the axis.

There can be no extralateral rights predicated on any such occurrence.

Second. The only terminal edge which is shown on this vein is that which is in contact with the overlying cap-rock-fraction dacite breccia—in the most easterly working of the mine.

If the surface as it originally stood at the time we exposed
491 it it would present an outcrop, apex or terminal edge, and would be the line along which the miner would locate his claim. This terminal edge or ancient outcrop crosses both side lines of the West End Claim. If there be a terminal edge its extralateral is easterly and not northerly or southerly.

Third. If we for a moment consider the occurrences as two veins—no-th dipping and south dipping—joining at their tops, the discovery vein is the north dipping one and the extralateral right is defined by extending the end line planes in the direction of the downward course of that north vein.

Fourth. The south dipping vein is a secondary one, and the same plane must be applied, and in the same direction as on the discovery vein. There is no sanction in the law for a double-barrelled or bifurcated extralateral right in two opposite directions.

Fifth. In order that there should be an extralateral right the end lines must be parallel throughout, and cannot be a curved or a broken line. The West End claim has a broken west end line;—therefore no extralateral right.

Now, if your Honor please, with this brief explanation of the status and attitude of the plaintiff with reference to this case we will proceed to put in our case as rapidly, and I trust as courteously as has been presented on the part of the defendant thus far.

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492 Testimony of E. A. BYLER, who being called and sworn as a witness on behalf of the plaintiff, testified as follows, to wit:

Direct examination.

Mr. Lindley: I will state that the survey upon which the maps and models were made was made by three different surveyors, and the notes were all turned over and tabulated and the model made upon those notes,—and Mr. Byler was one of the surveyors.

Q. Mr. Byler, what is your profession?
A. Civil and Mining Engineer.
Q. How long have you been engaged in that business?
A. About twenty two years.
Q. Have you carried on your business in Tonopah?
A. I have, in Tonopah and other places.
Q. Have you made any surveys of the property known as the West End, McNamara, Jim Butler properties,—the underground workings?
A. I have.
Q. What surveys did you make?
A. I made a survey of a large portion of the West End underground workings, the part of the Tonopah workings that is shown on the map, and all of the McNamara workings that are shown upon the map.
Q. To whom did you give your notes?
A. I platted part of them on the map and Mr. Uren did the rest of them.
493 Q. Such part as you have platted on the map are correctly platted?
A. Yes.
Q. Did you examine the map to determine whether Mr. Uren's platting is in accordance with your notes?
A. Yes, I have examined a large part of it and found it correct as far as I have gone.

Mr. Lindley: That is all.
Mr. Dickson: I have no cross examination.

Testimony of O. MCCRANEY, being called and sworn as a witness on behalf of the Plaintiff testified as follows, to wit:

Direct examination.

Mr. Lindley:

Q. What is your profession?
A. Mining Engineer.
Q. You are also a Civil Engineer and Surveyor?
A. Yes.
Q. Did you make any survey of the property in the Tonopah District known as the West End or McNamara properties?
A. Yes, sir.
Q. To what extent did you make the survey?
A. Why, I surveyed the greater part of the Butler workings that

show upon the map and a portion of the underground workings of the West End mine.

Q. How long have you been engaged in the practice of your profession?

A. Nine years.

494 Q. Have you examined the map marked Plaintiff's Exhibit 1, *the* determine whether your notes have been correctly platted?

A. Yes.

Q. Have they?

A. So far as I can see they have.

Q. To whom did you deliver those notes?

A. Some to Mr. Uren and some to Mr. Robens.

Q. Mr. Robens is an Engineer?

A. An Engineer at the Belmont and the Butler, yes.

Mr. Lindley: Take the witness.

Mr. Dickson: No cross examination.

E. C. UREN, being called and sworn as a witness on behalf of the Plaintiff, testified as follows:

Direct examination.

Mr. Lindley:

Q. What is your profession?

A. Mining Engineer.

Q. In what branches?

A. I have devoted my time mostly to under ground engineering and to mapping and model engineering.

Q. And surveying?

A. And surveying.

Q. Have you surveyed any part of the mines, the properties, delineated upon Plaintiff's Exhibit No. 1?

A. I have surveyed the westerly portion of the 400 level, and also the westerly portion of the stope between the three and four hundred levels of the West End claim.

495 Q. With reference to this map, Plaintiff s Exhibit-1, who made that map?

A. I made it.

Q. From what?

A. From notes given to me by Mr. Byler, and a part of which were platted by him. The greater portion, in fact, were platted by Mr. Byler.

Q. And other notes?

A. And notes which were platted by myself of that portion of which I made the survey.

Q. Did you get any notes of the Byler survey from McCraney?

A. Yes, we got the notes from Mr. McCraney of the Butler and placed them upon that map.

496 Q. What does that map then, so far as a combination of the surveys, underground?

A. It represents the actual underground conditions, beneath the surface of the claims as represented.

Q. From what?

A. Made from notes of the surveys which have been previously sworn to.

Q. What do the *the* colors on the map designate?

A. The colors on the drifts are merely placed thereon to designate the difference between one level and another, and the green border follows the boundary line of the West End claim, while the red tint follows the boundary of the Butler property, taken as a whole, which is shown upon that map.

Q. The surveys of the lines of the property are properly delineated upon that map?

A. They are.

Q. With reference to the numbering have you adopted any system of numbering so as to identify the locality by the first number?

A. We have adopted as nearly as possible the numbers used by the defendant in the case, but in some instances where the survey made by us was previous to theirs, of course, the numbers are different, and I have taken a series of numbers on the ends of the drifts, and at points where I thought testimony would be introduced and given them an arbitrary number, generally the number of the station followed by the letter "A" or "B" or some letter of the alphabet.

Q. The light yellow coloring indicates what? Is that a yellow?

A. It is a more a sienna coloring or brown

Q. I have reference to that color (indicating).

A. That color follows the area of stoped ground from which
497 the ore has been taken.

Q. That represents stopes?

A. Yes, sir.

Q. Have you any method of representing winzes, as contradistinguished to upraises?

A. I have. I place—in making a raise I make an arrow pointed line following the direction of the dip.

Q. How with winzes?

A. With winzes the same.

Q. How with cross cuts?

A. With cross cuts there is no designation upon that map.

Q. Now there are a series of lines commencing at the extreme east end or near the extreme end of the workings and numbered from zero up to thirteen. What do those lines represent?

A. Those lines are true north and south lines, from which the survey is coordinated. They represent sections which are shown upon the glass model and are one hundred feet apart.

Q. The glass model is identified as what exhibit number?

A. Plaintiff's Exhibit No. 3.

Q. There are other lines designated upon the map for instance the line, is that GG?

A. Yes, sir.

Q. And YX, what lines do those represent?

A. Lines GG and XY represent the plane of the section which we have as future exhibits.

Q. And the line PM?

A. That also exhibits the plane of the section.

Q. Now, in connection with this map in the preparation of your work and your duties in connection with this case, have you constructed any models?

A. I have.

Q. Calling your attention to Plaintiff's Exhibit-2, was that model constructed by you or under your supervision?

A. That model was constructed by Mr. Douglass of the Belmont, under my supervision.

498 Q. And what does it purport to represent?

A. It purports to represent a matrix, as it were of the underground workings. In other words it shows in solid what has been taken out and would be an excavation underground.

Q. From what was that model constructed?

A. It was constructed from the same notes which have been used in compiling Plaintiff's Exhibit-1.

Q. Is it correct?

A. It is.

Q. By whose direction, if any one's, were the colors placed upon the model?

A. The colors were placed upon the model under the direction of Mr. Finch and Mr. Searls.

Q. The red on that model indicates what? The red color if you know.

A. That indicates vein.

Q. And the other colors something else?

A. Yes.

Q. Those colors were selected, as I understand by the engineers, Mr. Searls and Mr. Finch?

A. Yes.

Q. Now with reference to the glass model which is Plaintiff's Exhibit-3. State who constructed that and upon what is it constructed, and what part you took in it?

A. The glass model was practically all constructed by myself from sections compiled by Mr. Searls and Mr. Finch, and are the same—they correspond with sections No. 1 to 13 upon Plaintiff's Exhibit No. 1, marked upon the top of the map.

Q. Briefly, what is shown upon that model other than the veins in reference to lines?

A. The lines of the drifts levels, raises and winzes, are shown, when they are slightly off the section by dotted lines. Those portions cut by the section are etched in black. The claim lines

499 are shown in black also. The fault lines are shown in blue. The Fraction diabase breccia is shown——

Q. Fraction dacite breccia?

A. Fraction dacite breccia is shown by a legend which is printed upon the first sheet here in black etching, colored with a light green. The Midway andesite is shown by a cross hatching in black. The

Mizpah trachyte is shown by green dashes placed close together, and the West End rhyolite by a legend, the sloping lines and dots, as shown upon Plaintiff's exhibit 3 in the legend.

Q. And those markings were put on under the direction of whom?

A. Under the direction of Mr. Finch and Mr. Searls.

Q. So far as they represent the mechanical reproduction of the openings, is the model correct?

A. It is. It has been checked and rechecked.

Q. With reference to the model marked "Plaintiff's Exhibit No. 4," I will ask you who constructed that model, Mr. Uren?

A. I constructed it.

Q. Under whose direction?

A. Under the direction of Mr. Finch.

Q. The legend upon the model indicates that it was drawn upon a scale of 100 feet to the inch?

A. Yes sir.

Q. I will ask you, so far as the mechanical parts of that model, the parts other than its geology, if it corresponds to the facts as shown by the survey?

A. As nearly as possible.

Q. The scale is smaller than the——

500 A. Yes sir.

Mr. Lindley: The further explanation of that model will be reserved until we put Mr. Finch on the stand. Any questions? I am through with the witness.

Cross-examination.

Mr. Dickson:

(Q.) Your map, exhibit 1, is on a scale of 20 feet to the inch?

A. Yes sir.

Q. While the general plan map of the Defendant Company is 40 feet to the inch, as you observed?

A. So I understand, I did not see it.

Q. Apart from the fact that the Plaintiff's Exhibit 1 is a much more artistic piece of work, more beautiful than that of the general plan map of the Defendant Company, and the different scale, is there any other difference that you are aware of? Anything omitted from your Exhibit 1 that is found on the Defendant's plan map, Exhibit B, I think it is, that you are aware of?

A. Not having seen Defendant's 40 scale map, I could — say. But I do not know anything that has been omitted on there. If there is, it certainly was not intentional.

Q. I am not intimating that that was so. Is there anything included, so far as you know, in the platting of the workings shown on Plaintiff's exhibit 1 that was not found on Defendant's general plan map, exhibit B?

A. There may be one stope which I intended to refer to with reference to Plaintiff's exhibit 2, and that is the stope numbered

501 upon this exhibit 2 No. 12.

Q. Is that not found on the Defendant's——

A. That is found on the Defendant's map or model. It is on the model, I know, but we were unable to get into the interior of that stope, and I took the liberty of putting it on after seeing Defendant's model in Court the other day.

Mr. Lindley:

(Q.) That stope is not platted on the map?
A. That stope is here on Plaintiff's exhibit 1, north of Station M, raise 38 on the MacNamara 200 level.
Q. It is not fully delineated on that?
A. It is not, because it was inaccessible.
Q. And you did not have the notes?
A. Didn't have the notes.
Q. I understand you that particular stope, however, you have undertaken to reproduce on your model, taken from the model of the Defendant which is on the same scale of yours?
A. Yes, we have filled in the interior of the stope, in other words, without the notes.
Q. You had an outline of the stope as it appears on that map?
A. Nearly all of the outline.

Mr. Dickson:

(Q.) What is your understanding, Mr. Uren, then, as to what the green on the Plaintiff's model exhibit 2 is intended to represent?
A. Which green?
Q. Well, are there two greens here?
A. Well, there is a green string following the exterior boundaries; I didn't know which——
Q. No, I do not refer to that. The workings, drifts?
502 A. That represents Mizpah trachyte, as I understand.
Q. That is what I am asking for. What coloring do you call this to which I now point?
A. That is orange.
Q. There is no figures here, no name to this line of work in the model?
A. That is the 700 Butler level.
Q. And why is that color adopted there?
A. That represents the Fraction vein. It is an orange color.
Q. Now, what is shown on Exhibit 2, Plaintiff's Exhibit 2 in yellow? What is your understanding as to what——
A. I understand that is the Fraction dacite breccia.
Q. Are there any other colors than the red and the green, and what do you call this brown?
A. That is an orange.
Q. Orange and the yellow?
A. Yes.
Q. What others?
A. There is a purple.
Q. Just point to it.

(Witness indicates.)

Q. What do you understand the purple is intended to represent?
A. I understand that represents the Midway andesite.
Q. Now, is there any other color that I have overlooked?

Mr. Lindley: Yes, if you will look in your upraises, you will see blue color.

Mr. Dickson:

(Q.) This represents faults, I presume?
Mr. Lindley: Yes.
The Witness: Not altogether. There is a light blue——

Mr. Dickson:

(Q.) Do you call this the light blue?
503 A. Yes, on the 600 Tonopah mining level.
Q. What is that intended to represent, as you understand?
A. As I understand, that is the glassy trachyte.
Q. And where is your dark blue?
A. The dark blue is on raises 2 A, 3 A, and so on.
Q. And what do you understand that was intended to represent?
A. They represent the Siebert fault and other faults.
Q. That darker blue represents faults, then, one fault or another?
A. That is my understanding.
Q. What color is this to which I now point?
A. That is a brown, and as I understand it, represents the West End rhyolite.
Q. What color do you call that?
A. Brown.
Q. Now, are there any other colors?
A. I think that is all.

Mr. Lindley: Black.
Mr. Dickson: I would like to have the Defendant's exhibit A uncovered. I wish it were here (indicating).
Mr. Lindley: Well, anything that you want done, you have the privilege of doing.
Mr. Dickson: Have it moved here now while I am interrogating Mr. Uren, and then if it is in your way it can be moved back again.
Mr. Lindley: That is all right, Judge. Go right along. Can you accomplish the same result by having it over there, Judge, and let the witness go and examine it?
Mr. Dickson: Have to go from one to the other, that is all,
504 take a little time.
Mr. Lindley: Well, let us try it. I do not care. Simply we are getting into a small corner here for active work.

Mr. Dickson:

Q. Mr. Uren, you have not shown the Fraction vein stopeing that is Exhibit-2.
A. I have shown two stopes in fact three.

Mr. Lindley:

Q. That is the south vein?

A. Pardon me. I have shown one stope on the Fraction vein, and that is stope No. 24 on the 400 level of the West End.

Mr. Dickson:

Q. You observe a difference in the stope represented on Exhibit-2, in which we find the figures 19, from the same stope as shown on the Defendant's Exhibit-A?

A. I do.

Q. And how do you account for that difference?

A. I was told that stope 19 was upon the West End vein, or a portion of the West End McNamara vein.

Q. It is different in shape also is it not?

A. It is different in shape, yes.

Q. And in size?

A. And in size.

Q. And how do you account for those differences in size and shape of the same stope as shown upon the two models?

A. I had not observed it upon the defendant's model.

Q. Just step over a moment and see.

—. (Witness inspecting defendant's model.) The stope on Exhibit 2,—defendant's exhibit 2, is not intended to represent the same stope, 728 and 724, I notice a slight difference possibly, but nothing extreme.

Q. You examined this model in court with some care?

A. I did, some two or three days ago.

505 Q. So far as the underground workings are concerned, so far as including the ore bodies or stopes,—is there anything shown to your knowledge upon Plaintiff's Exhibit 2, that is not shown substantially the same on Plaintiff's Exhibit-A?

A. I think that there is a little difference between the two models.

Q. *Do* far as you have been able to observe, they are practically identical, so far as the mechanical parts are concerned?

A. Yes.

Q. Some difference in color only?

A. That is all.

Q. Do you understand that Plaintiff's Exhibit 2 *shown,* or is intended to show all of the underground workings of the properties, so far as they are covered by the model?

A. Not altogether, no.

Q. What?

A. Not altogether.

Q. Well, practically all?

A. I would say that the Butler workings, the Butler stopes in particular, are not shown upon this model.

Q. Upon your model?

A. No.

Q. Well, in that respect there is a difference between the defendant's model and the Plaintiff's model?

A. There is more stopeing shown upon the defendant's model in the Butler workings, particularly, than upon this.

Q. The workings shown upon the defendant's model in the Butler

workings, 100 or 150 feet east of the east end line of the West End claim,—they are not shown upon Plaintiff's exhibit 2 those workings?

A. They are not; the stopeing is not.

Q. Have you shown any workings or any openings on Plaintiff's Exhibit 2, east of the east end line of the West End claim on Plaintiff's Exhibit 2, is there shown any workings or stopeings in
506 the ground that lie east of the east end line of the West End claim?

A. There is.

Q. What?

A. This T. M. Co. stope.

Q. Any other?

A. The anticlinal stope No. 19, also stope No. 15 in T. M. ground.

Mr. Lindley:

Q. That T. M. is Tonopah Mining Company, is it not Mr. Uren?

A. That is Tonopah Mining. That is all the stopeing that is shown outside of the east end line of the West End claim.

Mr. Dickson:

Q. Those stopes are also shown upon the Defendant's model, Exhibit-A and additional stopeing east of that?

A. Yes, sir.

Q. Is it your understanding that this model represents, or was intended to represent all of the workings upon the vein or veins, so far as they lie within the property of the McNamara Company, of the West End company, and the Eureka and Curtis claims of the plaintiff.

A. No, that is not my understanding.

Q. I was wrong about that. Does this model represent, or is it intended to represent all of the workings ore occurrences, or stopes, that are found in the vein in controversy which lie beneath the surface of the Eureka and Curtis mining claims owned by the Plaintiff company?

A. It does not represent all beneath the surface of the Curtis claim. I think that is the only exception.

Q. And is that an exception of minor importance?

A. We considered it so.

Q. Is the model intended to represent all of the openings and stopes, lower occurrences, as found upon the vein or veins
507 in controversy, that lie beneath the surface of the West End claim?

A. Everything that was accessable and possible to get, with the exception that there are two or three possible minor stopes that are not on there. I am not certain. We were rushed at the last moment, and there may be two or three smaller stopes that are not on there.

Q. Any that was omitted would be insignificant?

A. Yes.

Q. And the model as you understand it, is intended to represent

all of the workings and stopes, ore occurrences on the vein, so far as the model extends to the north, northerly?

A. It does, there is one exception and that is a small stope just to the west of the stope ten, which would be on an extension that we intended to place upon the model, but part of that stope was in such a position that we could not place it. I had it already cut out.

Q. That is virtually on stope ten?

A. Yes.

Q. That westerly stope is not shown upon Exhibit 2, but it is shown upon Defendant's Exhibit -A is it not? You cannot see from there—now, having on the model all of the workings, all of the openings and stopes and ore occurrences, this model so far as it extends easterly and westerly or northerly and southerly should present a reproduction of the underground workings and ore occurrences whether still remaining in the mine or which have been excavated and removed,—should it not?

A. Yes.

Q. That is the intention?

A. That is the intention.

Q. So that if the surface overlying the vein or veins has been removed, and the earth from that on down was transparent as glass, anyone walking over it and looking down could see the work-
508 ings and the stopes on the ore, just as they are in the mine?

A. Yes.

Q. That being so, what additional light is thrown upon the condition, as you understand it, by the stope, exhibit -3 or the glass model?

A. Well, the additional light, in my opinion is that we get a better idea of the layers of geology, as it were, by looking at the sections.

Q. What geology do you refer to?

A. I refer to the geology previously described on Exhibit 2.

Q. Will you be good enough to describe it again. I did not hear all that you said, what geology do you refer to particularly?

A. I refer to the geology colored upon Exhibit 2, which has previously been described.

Q. Well that is shown on Exhibit two, as fully and extensively as it is shown on exhibit-3, is it not?

A. Yes, a considerable amount of it is in such a separated condition that it is hard to judge, looking at either one way or the other, the actual condition on any particular cross section which you take,——

Q. The model, Exhibit 2 contains everything, so far as workings and ore occurrences are involved, and more also than is shown upon the glass model, Exhibit-3?

A. There is an exception to that and that is with reference to those faults, which can only be shown upon the portions which are in relief on the model.

Q. Well, with the exception of the faults, the model, Exhibit 2, shows all and more, so far as the workings and ore occurrences are concerned, than does the glass model, Exhibit-3?

A. Well, not to me; the connection is made from one point
509 to another upon the glass.

Q. What?

A. The connection between the layers of geology are made upon the glass, where they could not be made upon the model.

Q. Well, I will modify the question then somewhat. So far as the underground workings in the mine within that area covered by the model, Exhibit-2, more is shown,—all is shown that is shown upon the glass model, Exhibit-3 and more too?

A. With reference only to the openings, not the geology.

Q. I am speaking of the workings first.

A. As far as the actual workings are concerned, yes.

Q. And so far as the vein itself is concerned, and apart from the rocks that may lie above or below it, the geology that you refer to,—so far as the vein or veins itself or themselves are concerned, all is shown upon Exhibit-2 that is shown on the glass model, and more too.

A. I do not think so.

Mr. Lindley: Well, it seems to me just as a suggestion, as to the comparative value of these two models as evidence, I do not think that it is proper cross examination. Of course I do not care,—they show for themselves, and we all know that these models are made to illustrate testimony as much as anything else. You are asking the witness to draw a conclusion, which I do not think is proper,—well, is hardly within the scope of the witness.

Mr. Dickson: I suppose that if he constructed both models he would be able to answer that.

The Witness: I think I can.

Mr. Lindley: Well, who put the geology on that,——

Mr. Dickson: I am speaking of the vein itself, the ore
510 bodies that lie in the vein.

Mr. Lindley: All right.

Mr. Dickson: All that is shown on the glass model is shown by Exhibit-2 and more too, so far as the vein itself is concerned?

A. I do not consider that it is.

Q. What is shown so far as the ore or vein material of the glass model, that does not appear upon the wooden model?

A. I look at it this way: The glass model is clearer; we draw a section through any part of this model where we get directions upon the vein, which may be one hundred feet apart, can fairly be created by projections; it shows much clearer upon the glass model than upon that model.

Q. Made clearer by projections. Anyone looking upon this model, Exhibit-2, the underlying portion being transparent, they would have a perfect picture without any projections?

A. As far as the actual openings are concerned, yes.

Q. But so far as they differ, the ore is concerned?

A. If they could see also the vein which had not been removed, which you can here, it would be still clearer.

Q. Well, if that is intended to represent everything that can be

seen in the ground, and it would be transparent, it would give a complete picture as far as anything on there——

Mr. Lindley: Well, the purpose in putting the witness on is to identify the model, and the geology that was put on there is another consideration.

Mr. Dickson: Have you any objection to the question?

Mr. Lindley: No.

Mr. Dickson:

Q. Is anything represented on the glass model or any of the several sheets of the glass model, that could not be observed by one if he was looking through or along that identical plane of section under the ground; that he could not see if he had this wooden model before him?

A. I think there is; for instance the surface is one thing that we have on here and we have not——

Q. I am speaking of the underground workings and the vein or veins?

A. Not as to actual openings, no.

Q. Nor the ore occurrences, so far as they have been developed?

A. So far as they have been developed.

Mr. Dickson: That is all.

Mr. Lindley: That is all.

Mr. Lindley: I presume that we may proceed as we did when the defendant was putting its part of the case in, and assume that these different exhibits, as they are identified by the witnesses, may be presumed to be introduced in evidence.

Mr. Dickson: Yes.

510*a* JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,

vs.

WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

TRANSCRIPT OF TESTIMONY.

Volume I.

510*b* In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

No. 2999.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,

vs.

WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Certificate of the Court Reporter.

I, Joseph Lozano, do hereby certify that pursuant to stipulation made and entered into between the above-entitled parties and their

counsel, I acted as shorthand reporter of the above-entitled court and acted as such in the trial of the above-entitled cause; that the annexed and foregoing shorthand report of evidence, herein designated as Volume I., together with Volume II. herein, is a full, true and complete report of the evidence in the said cause, and contains, with the exhibits, records and documentary evidence therein referred to and identified, all the evidence offered, given or introduced in said cause by the respective parties upon the trial thereof; all of the objections and motions of the said parties thereto, or any part thereof; and all rulings of the court upon such objections and motions, and all exceptions to such rulings, had and taken during said trial.

Signed this — day of August, 1915.

——— ———.

510c I, Mark R. Averill, do hereby certify that I am the Judge before whom the above-entitled cause was tried; that Joseph Lozano was, by stipulation of the parties, the shorthand reporter who reported said cause; that the annexed and foregoing shorthand report of evidence, designated as Volume I. together with Volume II. herein, duly certified by the said reporter, is the report of the evidence in said cause, and contains, with the records, exhibits and documentary evidence therein referred to and identified, all of the evidence offered, given or introduced in said cause by the respective parties upon the trial thereof; and all objections and motions of said parties thereto, or any part thereof; and all rulings of the court upon such objections and motions, and all exceptions to such rulings, had and taken at said trial.

Dated: This 28 day of August, 1915.

MARK R. AVERILL,
District Judge.

510d In the Supreme Court of the State of Nevada.

No. 2195.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Appellant,

vs.

WEST END CONSOLIDATED MINING COMPANY, a Corporation, Respondent.

Certificate of Clerk.

I, H. R. Mighels, Clerk of the Supreme Court of the State of Nevada do hereby certify that the foregoing pages 1 to 510 inclusive, comprising Volume 1 of the Record on Appeal in the above entitled cause have been each compared and the same is a true and correct copy of the original now on file in my office.

Given under my hand and seal of said court, this Seventh day of August, 1916.

[Seal Supreme Court, State of Nevada.]

H. R. MIGHELS,
Clerk of the Supreme Court of the State of Nevada.

[United States internal revenue documentary stamp, series of 1914, ten cents, canceled 8/8/16. H. R. M.]

510*e* In the Supreme Court of the State of Nevada.

No. 2195.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff and Appellant,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant and Respondent.

RECORD ON APPEAL.

510*f* In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

No. 2999.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Bill of Exceptions and Record on Appeal.

(Volume II.)

510*g* JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Transcript of Testimony.

Volume 2.

511 Testimony of JOHN W. FINCH, — being called and sworn as a witness for the Plaintiff, testified as follows, to wit.

Direct examination.

Mr. Lindley:

Q. Where do you reside, Mr. Finch?

512 A. Denver.

Q. What is your profession?
A. Geologist and Engineer.
Q. Where do you reside?
A. Denver.
Q. How long have you been engaged in the practice of that profession?

Mr. Dickson: We will admit his competency Mr. Lindley.

Mr. Lindley: Thank you. I want to say right here that this is the most disagreeable part that a scientific witness has to undergo, but he has to undergo it because it is a rigid rule. We admit then as a matter of courtesy, but I myself feel, every time a scientific witness is put upon the stand and compelled to recite his qualifications, as a preliminary that it is to a certain degree humiliating and yet, at the same time it is the rule, and as it is so we will have to go on.

513 Q. Proceed and give us an outline of your career, in a brief way, your preliminary training, your experience, and the extent to which you have been engaged in the study of mining geology?

A. I have been actively engaged, in answer to the beginning of the question, for about 16 years in the actual business of mining, and the practice as a mining geologist and engineer.

My education consisted of a rather unusually long college course, in which I made a good deal of a specialty of the study of geology, but also during college and in post graduate work after college, studied those scientific subjects which go to make up the education of a mining engineer.

I have taken as college degrees, the degree of bachelor of arts, master of arts, and doctor of science. During the post graduate part of my education in the University of Chicago, and also for one year in Colgate University, I acted as instructor in geology. Also acted as an editor of manuscripts of the journal of geology.

Also served as instructor for a year in physics, and to a certain extent in mathematics, not only in my college course, but afterwards.

After leaving the University, my first experience in practical work in the field was in making maps setting forth the resources of what is now Oklahoma, and a large part of Texas, and Indian Territory, for the Rock Island Railroad.

After that job was finished, I began to go into more strictly the business of mining. Went to Cripple Creek and acted as the engineer and geologist first for one mining company, and after-
514 wards from time to time in a consulting way for a large majority of the mining companies of that district. And during the same period and afterwards, I was called upon to serve as consulting engineer in the examination of mines, to ascertain their value and to advise in the development of ore in the western states of the United States, Canada, Mexico, and largely for my own information, points in Europe. I do not think there is anything else of special interest.

Q. Have you examined the properties that are in controversy in this action, involving what is known as the West End, Jim Butler properties, and the adjacent properties?

A. I have.

Q. I will ask you if you have—to what extent your examinations in the Tonopah District have proceeded in connection with your examinations of these properties? To what extent have you investigated and studied the underground conditions, and how long you have been engaged in that study?

A. For a certain period a number of years ago I used to be in the Tonopah district quite often and had some knowledge of the developments here, say ten years ago, or thereabouts, and from that time on for a number of years. But the developments which have been made in the West End claim and the immediately adjacent properties, involved in this case, have been made largely since that time, and my knowledge of them has been derived since early in April of this year. And since that time I must have spent six weeks, or thereabouts in as critical study of the geological conditions as it was possible for me to make.

515 Q. Can you give us a statement, with reference to the area covered by your immediate investigation in connection with the properties in controversy?

A. That can be briefly stated as the area covered by Plaintiff's exhibit 1, and distance of a thousand feet, or thereabouts, to the south and south eastward, and considerably larger distances into the property of the Tonopah Mining Company to the east of the West End claim, and somewhat further into the working of the Tonopah Mining Company towards the north.

Q. I will ask you, before undertaking to describe the result of your investigations, if you will give us a brief statement as to the significance of the coloring on Plaintiff's exhibit 2, and at whose direction the colors were placed upon that model?

A. The color was placed upon the model under the direction of Mr. Searls and myself, and under the advice, which we used at all times so far as it was available, of Professor Lawson. The coloring of the model represents first, the most conspicuous feature, and the thing which the model is primarily intended to represent, the West End MacNarama vein, which is shown in red. Blue markings upon the model at various points, as, for instance, towards the easterly end of it, along certain high points in the MacNamara West End vein, show faults.

Q. And the two colors of blue upon the model?

A. The color last referred to is the dark blue on the model. In one limited area toward the east end, and particularly in the Tonopah Mining Company workings, another lighter blue is used to
516 indicate the glassy trachyte, which underlies the vein in that region.

Mr. Dickson: I did not hear the last of that answer.

A. Which underlies the vein in that region. The green color, or bright color as shown around the Jim Butler workings and through-

out the model, mostly just above the vein, is the Mizpah trachyte. Next above the green color after the shafts in the central area of the model, will be seen a violet or purple color, which represents the Midway andesite cap rock. Above this still higher is a bright yellow color, which is another cap rock or Fraction dacite breccia.

Green strings extending downward below the model connect with the outline of the West End claim shown upon the map at the base of the model, which forms the mathematical basis for the construction of the model itself.

Underlying the vein in most of the area of the model is another rock which is shown in brown in various workings under the vein, as painted in red. This is the west end rhyolite, colored brown. Black occurs at various points on the model and is intended to be the color of structural features.

Mr. Lindley:

(Q.) Structural features of the model?

A. Yes.

Q. Not of the geology——

A. Not geological structure.

Q. Supports of the model?

A. For instance, some of the shafts do not extend all the way to the base of the model, but are convenient as mechanical means of support, and to that extent they are colored black.

517 Q. In other words, instead of leaving the bottom of the shaft in the air, you put a support on it and colored it in black?

A. Let it continue down, because it helps to hold the model up.

Q. With reference to the model, Plaintiff's exhibit 3, will you explain to the Court the function of that model? What its purpose is, what it purports to show, how it was made, and under whose auspices, whose direction?

A. It was made by Mr. Uren, from rough drawings prepared by Mr. Searls and myself, and embodying also geological information. Partly occupied with other things, and I did not state that entirely correctly. I wish to amend that by saying that during the study of the geology of this case, Mr. Searls, Mr. Siebert and myself have combined our notes, compared our notes and prepared a series of sections, from which Mr. Uren has prepared the glass sheets in Exhibit 3. In the preparation of those cross sections, and in the making up of our notes, we have had the advice of Professor Lawson for a large part of the work. So that it embodies the geological views of all of us.

To explain the construction of the glass model, I hold now in my hand just one of the cross sections which were constructed or inked in, beautified by Mr. Uren. This section No. 7, being the 7th sheet, showing the geology in the glass model; as will be seen from the sheet, certain workings are represented on any given plane of the section, these are colored in yellow. To that extent, the cross section drawings represent the same things shown in that given

518 plane in exhibit 2, or the skeleton model. The purpose and effect of cross section Exhibits of this kind is to enable a con-

tinuous representation of vein and geological structure to be made, where there are gaps in a skeleton model such as exhibit-2.

Q. Now, I will also invite your attention to Plaintiff's Exhibit No. 4, and simply identify it as to circumstances under which it was constructed, and when we reach that period in your examination when it will be appropriate to discuss the details of the model, you may then take up the details. But I now call your attention to Plaintiff's exhibit 4, what we might call a block model. I will ask you to state how that was prepared, by whom that was prepared?

A. Plaintiff's exhibit No. 4 is a model constructed in several segments. It is made of wood in the main. There are certain irregular surfaces between the several blocks composing it, so irregular that it was necessary to supplement the wood by plaster, so the model is a little fragile for that reason. The Plaster tipping off unless it is handled carefully. The data for the model was of two kinds; one, mathmetical, which is the surveys and maps already described. The other is geological, and is determined by geological observations in the ground. The mathematical part of it, of course, was in Mr. Uren's possession. The geological part of it, I supplied to him and the mechanical part of it, he executed. The model represents at its surface, when it is all placed together, represents the present surface of the ground; of course, as accurately as within the limita-
519 tions of material of this kind. It is not possible to build it so accurately as it is to draw a map.

Q. Considering the scale?

A. Yes. The uppermost layer being taken off, removes this particular area which corresponds, in a general way, with the area covered by the big plan map on the wall. This upper surface, the upper block of the model being ta*kne* off, the fraction dacite breccia is removed, showing a hillside or sloping surface mentioned by yourself, Judge Lindley, in your opening statement.

The surface of the ground in the model, as it now stands, was at the time when this surface existed, higher than at the present time. No attempt has been made to indicate that.

Also subsequent to this surface, there has been some faulting but—all the essential parts of it, will be discussed, that has not been represented except on the edge of the model.

The little block which I am now taking off, lying in the north east corner of the model is of an ir-egular form, and the sinuous edge of it is not to be understood to represent anything in the nature of geological feature, or otherwise. That is merely a mechanical means of filling up to the present surface beyond the edge of the fraction dacite breccia, *at* it is now known.

Q. What does that represent?

A. Nothing except the filling of that corner beyond the fraction dacite breccia and over the hanging wall side of the vein. Removing the 3rd block from the model, the Midway andesite cap is removed from the vein. Also a certain amount of the hanging wall
520 lode porphyry above the vein, and the hanging wall of the West End MacNamara vein is shown, generalized to a certain extent, but on the whole conforming very closely with the more de-

tailed sections shown in exhibit 3. The western end of the section, then, that is that end of it at and beyond the west end lines of the west end claim shows a portion of the old eroded surface and the outcrop of the West End MacNamara vein, as it existed on a hillside when this old surface was the surface of the earth.

Q. Now, Mr. Finch, I wish you would proceed and state as succinctly as you can the extent of your investigation, the nature of your investigation, and describe the results of that investigation, so far as you have investigated the property, giving as you pass along and state a deduction, giving the reasons for it?

In order to not interrupt you in the chain of thought, I will not do so unless some question of importance suggests itself by way of parenthesis.

A. If it would be entirely proper to do so, I should like to preface or to begin the answer of that question with a general statement of the geological conditions as I have found them in the ground, in order that the separate details may be more conveniently fitted together as I proceed.

For that purpose, I should like to have some sheets of blank paper which I saw lying here yesterday.

(Same handed to the witness.)

521 Mr. Lindley:

Q. You may mark that "Finch 1," so as to identify the sketch.

A. (Witness marking sketch.) As I understand it, and judging from the details of geology which I find in the workings of these mines under consideration, there was at one time,—because we do not need to begin at the beginning,—there was at one time a certain rock formation generally known here as the lode porphyry of the district, the rock formation from which the ore has mostly been produced. This rock formation, as is the case with volcanic rocks, usually, was not regular in formation, altogether, but, as a general thing, so far as I can determine, if a cross-section is taken north and south, which has been done on the large map on the wall, or, parallel with the glass sheets in Exhibit 3, this rock formation may be generally shown as a comparatively flat lying body, crossing the area which we are discussing. This drawing is intended to be only a diagram, but for the purpose of illustrating some of the steps in geological history. Underlying that rock were a variety of other rocks at some time in the history of the district. It is not necessary, I believe, to go into the differences of opinion as to the age of those rocks underlying this lode porphyry because the essential fact remains that the plane of meeting along the bottom of the lode porphyry, which I will mark "M. T.,"—which is the plane of meeting along its bottom with various other rocks, but mostly with one certain rock known as "West End Rhyolite,"—which I will now mark "W. E." for West End.

Q. Better add the "R," "West end Rhyolite."

A. Yes (indicating). A little area which I have outlined
522 in green to the left of the drawing may be considered as any

other one of several rocks which underlie the lode porphyry. It will be seen upon the drawing that at the bottom of the Midway trachyte there is an undulating line; although this does not represent in detail the occurrences in the ground, it, nevertheless, represents in a general way the actual conditions. At a certain time,—when, we do not know,—but a long time ago, along that irregular line there was caused a shattering of the rocks, induced doubtless, by any one of several volcanic disturbances which affected the district after this condition which I have just described had been developed. The shattering of the rock resulted in the crushing of the Midway trachyte,—the Mizpah trachyte,—or the lode porphyry, generally along the line of contact. There appears to have been just sufficient dislocation, or jogging, of the overlying rocks upon the underlying rocks to have caused a sufficient amount of indefinite fissuring, or fracturing, and in some cases a fracture passed across little depressions in the base of the Mizpah trachyte, leaving a certain amount of it below the zone of fracture; otherwise, it followed the contact very closely.

The blue is intended to represent just a step in the process, this zone of fracture having been formed at the base of a rock favorable for the reception of ore deposits, and this having been a volcanic region and still a region, probably, of considerable volcanic activity at the time which we have now reached,—solutions, and probably hot solutions, containing materials which usually go to make
523 up veins and ore deposits, began to circulate and spread along this zone of fracture. So, our lines, which we have represented in blue,—blue being used as a usual and conventional representation of cracks and faults and seams in the rock which are of mechanical nature only. This is replaced and filled, now, gradually, probably, with one definite period more or less closing, followed by another period of activity by some second or third disturbance of this line of weakness, reopening older deposits of vein quartz and filling—the cracks made in that, and new cracks made out into the country with additional quartz and additional ore minerals, and we finally have a vein which I am now drawing in red, of great uniformity and containing in it immense masses of quartz, much greater bodies of quartz than the other veins of the Tonopah District which I have seen. Now, within this broad band of quartz there are certain fractures, lines of fracture, mostly clinging closely to and in the quartz itself. Along this line the commercial minerals are formed, and outward from these lines, mostly from the contact, commercial minerals also extend, through the quartz, and outward in a ramifying, interlacing way, into the overlying Mizpah trachyte, which I am now indicating by the twisting streamers which run up from the plane of contact, penetrating veinlets of quartz extending out from the main vein of ore, usually termed by miners as quartz stringers. Downward in the foot-wall side, also, and particularly at certain points, there are stringers of the same nature and such an area as I have now indicated where that fracture cuts across and leaves a body of Mizpah trachyte or lode porphyry underneath the vein; those stringers are especially conspicuous. Also, at cer-

524 tain points in the West End Rhyolite, these stringers are quite conspicuous down in the foot-wall side, and, I might add, that although they are of no particular importance *un* tracing the continuity or fixing the identity of the vein under consideration, there are other fissures underneath the vein and in the underlying rocks which are of different age and have no significant connection with it. Such veins as these are found particularly on the 500 level of the West End, past where I am now indicating, in the region of the McQuillan shaft, cross-cutting through the West End Rhyolite; they have a general northeast and southwest direction and stand vertically; they have a different form and a different time of origin than the vein which we are discussing and they are not the quartz stringers which I am now representing as being genetically connected with the big contact vein. And there are certain other little details which will come out better in connection with some other steps, and I will mention them now. At the summit of undulations in the contact vein, where there is a sharp bend to pass in the slight movement of the overlying rock which caused this fissuring, there is in some places a special complexity of the cracking of the rock and the development of the quartz stringers which filled those cracks. Places such as that are found in the Jim Butler workings, and they have already been referred to in the region of the little anticlinal stope; other places are found which are very conspicuous. Over in the MacNamara where there is a very slight roll or undulation in the vein,—some in the position I am now indicating,—is a great
525 amount of fracturing, extending into the handing-wall in a number of quartz stringers. The vein, as it is drawn rudely upon the sketch, is now intended to be represented as complete. No more ore deposition took place in it. We find it not dipping, in general, very much in a north direction, nor in a south direction, but lying rather flat, taken as a whole, beyond the regions represented in the map, Exhibit No. 1. In that particular region we are considering we have this special prominent undulation which has been referred to as the crest of an anticline. Now the dip of this body, as a whole, is not in a north and south direction, or in either a north or south direction, but is, as a matter of fact, in an easterly direction, and this particular ridge can be seen by looking upward through the sheets in Exhibit No. 3. The ridge stands over, in my sketch, the letters "W. E. R." It is as if, just for illustration, you would take a sheet of corrugated iron, dip it downward and hold it by one end. The dip of a sheet of corrugated iron is downward along those ridges, and this ridge may be represented, may be spoken of as a ridge of such a nature and the dip of the body, in general, as eastward. The vein now having been formed in the shape which I have described, other volcanic disturbances took place, a certain amount of this Mizpah trachyte had been removed, a certain amount, probably a very large amount, of volcanic material fell—upon the surface, or flowed upon the surface, and covered the eroded Mizpah trachyte. Then, another long period elapsed, long in geological time, because we find in the workings of the mine this cap rock, the Midway andesite, had also been eroded in a sharp, mountain-side

526 slope, and *and* that the end of this vein westerly, as exhibited in Plaintiff's Echibit No. 4, had been sliced off and formed a conspicuous quartz outcrop on the slope of this hill. Being a large body of quartz, it was an unusually conspicuous outcrop; and after those long geological steps had been taken, still later disturbances, caused by the latest volcanic eruptions, concerning which we have no interest in this particular matter, except for the purpose which I am now going to state,—some of those very recent eruptions caused the disturbance of the rocks of the country so that faults were formed in various places,—some of these very conspicuous and important faults. One such fault cut through the remaining Mizpah trachyte overlying the vein, two cap rocks overlying that, and a great mass of country slid downward from the direction of the west end of the West End claim through its east end line and in a northeasterly direction, carried a great mass of over-riding rock in the direction of the Tonopah Mining Company territory. In doing so this fault was guided, to a very great extent, by two things; it sought, as a plane of weakness, or as a region of weakness, those rocks which are most easily broken, but its direction was deflected at certain points by very hard rocks, such as the quartz of this vein, which caused it to curve and take a direction which it might otherwise not have taken. This fault, which I will call the Siebert fault, on account of its possible or probably correspondence with such a fault over in the Tonopah Mining territory, had some such form as I now indicate. It probably broke into more than one plane at certain points, but in any event was a very distinct and pronounced fault, in which the
527 over-riding rocks downward, along the slope of this anticlinal, fell toward the east. Now, on the cross-section of the vein, a cross-section running north and south, as the planes of Exhibit 3,—this fault touches the vein only for a very short distance and only at approximately the summit of the ridge of the anticline, which passes eastward in the region of the north side-line of the West End claim.

Mr. Dickson:

Q. Point out on the model where that touches the vein, near the summit.

A. It touches it in the raises which have been,—at the foot of the raises which have been driven by the defendant company, and most of the raises,—that is, the A raises, which are closely grouped together, from 2A up to 7A and then in the A raise in the dome-shaped MacNamara stope, and at various points in the ground,—one of them I think you call Raise 3,——

Q. Raise 302.

A. (cont.). Raise 302, which is about in the middle of the model.

Mr. Dickson:

Q. Well, with Mr. Lindley's permission,—Do I understand then, in your opinion, Mr. Finch, that the Siebert fault, so called, touches this vein at the summit or crest of what you call the anticlinal fold from practically end to end?

A. I believe it does. The little block-model will illustrate it to the Court better than anything else, I believe.

Mr. Lindley:

Q. Referring to Exhibit 4?
A. Exhibit 4.

At this time an adjournment was taken until 2 o'clock P. M. December 14, 1914.

528 Afternoon Session, 2 o'Clock p. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consoiidated Mining Company.
Mr. Lindley: Mr. Finch, will you resume the stand?

Direct Examination of JOHN W. FINCH, resumed.

Mr. Lindley:

(Q.) Mr. Finch, as the Court adjourned, you were about making some explanations, or developing your idea with reference to the conditions. Will you proceed at the point where we left off?

A. The Siebert fault was under consideration, and before leaving this diagram upon the wall, to make the conditions a little more precisely as they are, the Siebert fault in the trough-like portion of it, where it comes down, dipping toward the north east and in cross section dipping towards the north in the drawing, breaks into one or more of the branches at places. I will mark this main fault, the Siebert fault on the drawing so it will be identified.

It might be well now to consider some of the reasons why I know this to be a fault. In the first place, it is a prominent fissure containing materials which are commonly known to miners, as constituting materials of fault. It contains a tough, heavy clay gouge and in very consid- quantity. This gouge material is the product of the grinding of one mass of rock against another, and will vary, according to the rocks through which the fault passes in its
529 color and appearance, sometimes in its amount. Within the fault, as within all such——

Mr. Dickson:

(Q.) What is that?

A. Within the planes or walls or boundaries of the fault, and within the gouge, there are fragments of material which are so hard that they have been pulverized into the clay which is called the gouge. Such fragments, where the fault comes into the vicinity of the vein are usually fragments of quartz broken and rounded and smoothed by the movement of the over riding mass of rock upon them. Such fragments of quartz are usually termed drag quarts, as distinguished from vein matter found in place within the vein. Those two features are the marks of faulting.

The best proof of faulting, however, is in the determination of the dislocation of definite formations of rock, or features in the

rock which can be identified on the opposite sides of the fault. After the fault occurred, as shown in the sketch, "Finch No. 1," the Mizpah trachyte which had formerly existed here, and which, as I stated, had been to a certain extent eroded and overlaid by Midway andesite, was naturally faulted by this fault, as were the overlying rocks. If, then, a contact can be found between those two distinct rocks, on each side of the fault, the magnitude of the faulting, at least in the direction in which it is developed, can be found, and the magnitude of the faulting with a number of exposures of this kind in its greatest direction can be determined, if considered in connection with the marks of the direction of movement of the fault.

530 Now, we find underground in the mine in this fault, as it almost invariably the case with all faults, that there are marks in the direction of the movement. These marks are in the nature of grooves, striations, markings upon the wall of the fault, upon the rocks which overlie and underlie it.

These striations or grooves have a direction down the trough which the fault occupies in an easterly or somewhat north easterly direction, and are remarkably uniform over the entire area in which the fault is developed within the area covered by the model exhibit 2.

It is found by certain developments in the mine that the Midway andesite which covered an eroded surface of the Mizpah trachyte has dropped down from a certain elevation on the south side of the fault to a lower elevation on the north side of the fault, so that rock which was formerly Mizpah trachyte before the fault came on the north or overlying side of the fault has now become, to a certain extent, a Midway andesite, which I will indicate by the little cross marks.

Going further up along the dip of the fault into the still later and overlying formation, the Fraction dacite breccia, we find that the fault also cuts through that and also faults that rock. So the fact that it is a fault and that it is a fault of very considerable displacement is very distinctly shown.

Then, in addition to all those considerations, it is found that the stringer zone, or border zone overlying the main body of the vein has also been sliced off by the fault, where the fault descends

531 low enough to cut that zone, and at other points where the fault does not touch it, that zone still exists, which is still an additional reason or indication of faulting.

Mr. Lindley:

(Q.) While you are on that subject, Mr. Finch, I wish you would give, for the benefit of Court and Counsel, all the indicitia from which you infer the relationship that this fault bears to the hanging wall section of the West End MacNamara vein?

A. That portion of the West End MacNamara vein which is most nearly approached by the fault is the portion lying to the north of the ridge of the anticline and in the MacNamara territory. If I could persuade your Honor to sit in the witness *share* for a moment, I can explain that on the glass section model.

Q. Before you take up that model, and as a parenthetical question,

Mr. Finch, I wish you would explain that model, what the dotted lines are to indicate, and to what extent there is projection, and what is the data for that projection? Is there any distinctive mark on the model indicating actual observation from projected objects?

A. Yes.

532 Q. Now, will you explain to the Court just exactly what that model represents, and its construction, and what its purpose is, for the purpose of showing the difference between the dotted and solid line, and the data, from which the dotted lines were extended?

A. All the features in the glass cross section model, whether they be geological features or workings in the mine,—if they are cut by the plane of the section, they are shown in solid outline; if they are within a reasonable distance of the section, so that they can be represented in the section, and throw some light upon the geological conditions in the plane of the section, they are represented by dotted lines.

Mr. Dickson:

Q. Do they show the extent of the projection?

A. The plane will in each instance show the extent of projection.

Q. Does the glass show the extent of the projection?

A. It is not written in on the glass sheets, for the reason that on the plane map, the amount of projection is always clearly shown; if, for instance in cross section No. 7, it should be desired to show the geological features of the cross cut—running northerly from station 1155, it will be seen that that cross cut lay for a part of its distance very close to section 7, as shows precisely on the plane map, and where it enters the section it will be shown in solid outline; where it is near the section but not exactly on it, it is shown in dotted lines.

Mr. Lindley:

Q. In all cases the dotted lines show the projection from known data?

A. Yes.

Q. Now, explain generally the situation as to that model, the glass section?

533 A. I am going to explain the principle upon which the plan of the glass model was made.

Q. Mark that "Finch-2" please.

A. (Marking.) And make this explanation for the purpose of showing how geological features in the ground are represented in the cross sections, as distinguished from the representation of mine workings. If we have, say, a shaft sunk in the earth, (indicating) if from that shaft a level is driven, as I now indicate and at the end of the cross cut on that level there be a drift on the vein; if at another point lower down, there be another level driven, as is customary in mining, and a cross cut is driven in the opposite direction, say,—it does not always stay in this line of section, but somewhere near it, we represent that cross cut with dotted lines, until we reach a point out here where there is a drift showing the vein. If after-

wards a shaft be driven and ore taken out of the vein above the level it is usually taken upward from the level, as I indicate now in the cross section,—this being a plane transversely or across the stope; now, if, in all that development the miner has found that he has a vein on the first level, which dips as I now indicate,—if in sinking his shaft he finds that he has a vein here, and in driving his stope and doing his drifting on the lower level he develops his vein in this form,—now it is true so far as the miner or expert or any man can see that vein is the limits of those workings, as they are drawn upon that sketch, but it is absolutely obvious, there being no vein further down the shaft, and no vein further up the shaft, or in these workings that that vein is the same vein; where a geologist, or miner, for that matter, connects those segments by a dotted line, and the
534 geology is therefore represented, and the sketch is intended to represent it better than the cross section has on the wooden model, which merely shows the opening, because the vein cannot be shown to connect in reasonable form.

Q. Then, the reason of the connection can be examined and determined from the relation of the dotted lines to the solid lines?

A. Yes; the geological formation-, such as rock formations are represented in the same way, and with respect to the representations on this glass model, I will state that where the contact between two rocks is developed in a certain working, that is on a section, it is shown definitely and exactly; where between points of development it is hypothetical but still reasonable it is represented by dotted lines as in the case of the vein which I illustrated; and in the construction of this glass model we have data secured to and fro all through the model as to the position of these certain rocks; that data is connected up in a reasonable way, if for instance on the Siebert Fault a certain amount of displacement is shown at one point, that displacement is shown at all points, as it must be.

Q. Well, now, that explanation for the purposes and functions of that model, and the differences between the solid markings and the dotted markings, you may continue with your explanation.

A. As I understand it you wish me to explain the relations of the Sibert Fault to the vein,—was that the question?

Q. Yes. I wish to know all of the data and all of the explanations which you have which explains the relative position that that Siebert fault occupies to the hanging wall section of this vein?

535 A. These series of cross sections show, the Siebert Fault, with blue line markings, practically the plane or fault. Sometimes it is one plane, the gouge, and sometimes it is two, and the points where it is of two branches are developed at various places in the mine. It will be seen by selecting a line of vision, down towards the bottom of the model that there is a close correspondence all the way through forming a trough, shaped surface over the fault; that the fault has trough shaped form. Now beginning at the east end, the vein has been developed in stopes which are indicated upon the model on the right half of that sheet; other developments upon the vein over and continuously on the solid mass of quartz of the vein

in the point where it turned over in dipping in the opposite direction, very slightly in the McNamara is also shown. Now, a close observation of the model will show not only the design for the rocks but certain little dashes and lines of red which are the halo or zone of stringers extending into the hanging wall. The vein and the fault are both developed definitely in the cross section. A certain raise which has been called Raise 488 on this cross section No. 1 is driven upon the fault now. In its original condition it cross cut through the fault, but the fault now shows its entire length practically; it is a distance of some forty feet from the fault downward to the main or solid part of the vein; in this section, in other words, where the development is exact the fault is not in contact with the vein, and there is a considerable intervening body of the hanging wall country rock, filled with stringers.

On cross section No. 2 there are a series of workings shown; those shown solid are actually in the section and are the direction of
536 the fault, their progress westward impinging upon that northerly slope of the summit of the anticline; and, — rising against it a solid streak of quartz which bent up a little more sharply than usual on both sides of the incline, and it has some distance below it other streaks of the vein which are solid quartz; here the vein, in other words, is in contact with the quartz for a certain distance, but in passing northward towards the workings of the Tonopah Mining Company development upon the fault, near at hand to this section as shown, it *has* departs from the vein, and there is country rock between it and the vein.

537 Cross section No. 3 is a very thoroughly developed cross section in which a stope upon a streak or strand of the main vein has been followed in the operations of the West End Mining Company, and have passed the summit of the anticline downward to a certain extent towards the MacNamara territory. The fault is here in coincidence with the summit of the anticline and downward on the slope for a certain distance.

Then, workings in the MacNamara and Tonopah Mining Company show the position of the fault to be above the vein. I can show that also on the plan map later.

On section No. 4, the fault is in coincidence with the vein near the summit, and down the slope of the MacNamara side of the anticline for a distance of some 200 feet, at about which point it departs and leaves a mass of the hanging wall trachyte between it and the vein.

Section No. 5 shows the fault in contact with the vein at slightly lower point in the MacNamara, but as you go northward, departing on its dip and running up into the hanging wall rock.

Section No. 6 shows the fault not in contact along the ridge, but in contact a little lower down at a point; but throughout the distance of development upon it, not over 20 per cent of the development showing the fault in contact with the vein, and not over 6 or 7 per cent of the actual length of the fault in the plane of the section in contact with the vein.

Section No. 7 shows a condition of considerable coincidence of the

fault with the vein in the MacNamara workings, but probably
538 not at the summit, not entirely developed at the summit.

Then, Sections No. 8, 9, and 10 show similar conditions of coincidence in fault with the vein at points as, for instance, here (indicating), large masses of hanging wall country rock lying between them at other points.

Q. In other words, the fault departs from the vein as you go away from it?

A. Yes, the fault is guided in a very general way by the high points on the vein. But the fault cuts off or removes very little, if any, of the solid part of the vein, but it does carry away from the hanging wall side of the vein along the crest of the ridge and slopes northward from it quite an area at places, as would be indicated in any of these sections of the stringer zone above the vein, but that is all it does remove apparently.

Next there are two sections, 11 and 12, which show the development of the fault in contact with the vein for a distance similar to those in the east end of the mine, and still more detailed development of the fault passing upward and leaving the vein into the west end ground.

This development has been done in raise A, heretofore referred to in the testimony of the Defendant.

Now, all of those points are shown upon Exhibit 2. The last point, raise A shown upon this model, as upon the model of the Defendant, and the fault is indicated in blue running up the raise. The same fault is developed in the raise which, for convenience, I will call the side line raise, I do not know what number it is, 152,
and it developed for a considerable distance, some 200 or more
539 feet in that raise, and in the working connecting with the bottom of the raise, and is shown in blue upon the model.

Now, at this particular point, it may be of interest to show the actual direction of that trough which the fault occupied in a general way, and it is somewhat as I now hold the pointer.

Mr. Lindley:

(Q.) Can you give the terminal points there by the numbers on the model, so that we can get it in the record?

A. Well, the north easterly direction of the fault is shown by the striation, and it is very nearly on the dip of the fault and the direction of the trough, I now indicate with the pointer, starting at the top towards the west top or apex of the vein, towards the western continuation of the fault, b-yond the vein, in raise A, down into the workings of the MacNamara and through a point on the 500 level of the Tonopah Mining Company, where the fault is clearly developed, showing the downthrow of the overlying cap rock into j-xtaposition with the Mizpah trachyte, And that point is near the point shown upon the model where the numbers 500 C. M. are indicated.

Q. What does that represent? The trough, or syncline of the trough?

A. Yes.

Q. Represents the syncline or the bottom of the trough?

A. Yes. Yes, that is the depression. If it were a solid surface, it is the line along which a stream of water would flow.

Q. Now, you have spoken of raise A and the conditions in raise A. I wish you would correlate that with the conditions in a
540 series of raises which you say were put up on the fault indicated upon the model from 2 A to 7 A?

A. That question can be answered in a simple statement, I think. The conditions are identical. Each of the raises, A raise, 2 raise, 5 raise, 4 raise, 7 raise dev-lop the fault upward beyond the summit of the anticline and into the overhanging country rock.

Q. Explain what is shown in the raises made up there to indicate that the material in there is—the character of the material? Please explain the character of the material in those raises, and to what extent they are vein material, or if they are vein material, to what vein it belongs, and how the fault cuts it?

A. The fault lies along the top of the raises and has crossed the surface of the solid quartz of the anticlinal vein. The materials of the fault are shown in the gouge or clay and the included fragments of quartz. The faults in any one of those raises may be represented as a fissure which cuts across various planes of cracking in the rock, in which streamers of quartz had extended up from the main body of quartz below in the main anticlinal vein, as I now indicate.

Q. Mark the left hand section there A, and the other one B. Your last remarks apply to the sketch B on "6 No. 2"?

A. Yes. Now, in one of the raises, 5 A, near its top, a conspicuous band of quartz has been found, which, when we construct all these things, mathematically, consistently together, we find to be the Fraction vein. The Fraction vein is found in that raise taking a form as I now indicate. There is one form of what the
541 miner and the geologist both call drag, indicates the direction of the faulting. Down here along the raise at various points in the clay gouge are found fragments not only of this Fraction vein, but of any other seams which extended up across, which the fault cut in its course. So that in those raises there is a considerable appearance of quartz.

Mr. Dickson:

(Q.) Considerable what?

A. Considerable appearance of quartz partly at the top of 5 A raise, where it cuts the Fraction vein. The quartz increases somewhat in all these raises, taken as a general thing, as you get down towards the main body. In 4 A raise, for instance, a very considerable body of quartz which does not look especially rich, but still is, nevertheless, a part of the vein; a considerable body of quartz which runs up something as I now diagram it, and is cut by the Siebert fault, as are all the other bodies of quartz in all those raises, none of them are parallel with or conform with, or show any relation to the fault plane, except that they are cut off by the fault plane.

Incidentally, those raises also show, some of them, 5 A especially, the overlying Midway andesite cap rock which has been brought down by the fault over the Mizpah trachyte, the rock under the fault being a Mizpah trachyte or lode porphyry. That condition represents in a diagrammatic way the condition in each of the raises hitherto described.

In answer to the question, 302 raise shows a similar condition, and much more extensive development of the same condition. It not only develops the fault up away from the hanging wall, but it also develops the fault for a long distance up into the
542 Midway andesite, showing its age with reference to that rock. Raise 488—I do not understand the question went into that.

Q. Well, you may proceed on your own suggestion there.

A. That differs from the other raises in the fact that it does not start on the main vein, but starts up from the stringer zone, and in the stringer zone and therefore in the country rock, and follows the fault up to the Midway contact. That raise would be in all its essential features, like the middle regions of such a raise as 5 A, but it is starting in at a certain point, as I remember the exact distance was something like 27 feet up the raise, where the fault comes in clearly developed, and then a little space in which it is not developed, and it is shown again in the tip of a working running north at the level from the foot of the raise; then at about that same point a seam of partly replaced country rock, fissure material older than the fault is developed up the raise to the end of it, and at the end of it, this seam of quartz, if it may be regarded as continuous, is cut off by the fault, so that it has its two ends in the raise, an upper and a lower end.

Q. This Siebert fault, as I understand you, is the latest phenomena, geologically speaking, that occurred in that section of the country? It was after the formation of the vein?

A. Yes. It is later than anything else except possibly one thing up near the top of the McQuillan shaft, is a little Oddie rhyolite, so called. I assume that it is Oddie rhyolite, because Mr. Spurr states that it is. That might be later than the Siebert fault,
543 from the date which we have at hand.

Q. It has no connection with the vein?

A. None whatever. The fraction dacite breccia underlies that.

Q. And the quartz in this fault, as I understand you, was quartz which appears through the operation of the fault after the creation of the vein?

A. Yes; long after the creation of the vein.

Q. In other words, the fault is a postmineral fault?

A. It is, yes. There are two or three other definite points which before the subject is——

Q. I wish you would bring out in your testimony every indicia that there is to justify your deductions that this is a post mineral fault, that the quartz shown in it is the hanging wall segments that are cut by it of the main vein which lies below.

A. I think it would help to make the matter clear if in answer

to your former question the definite points were shown upon the big plan map.

Q. Very well. Just take those points and present the matter from that.

A. We can start, for instance, at the 300 level of the West End, in an immense body of quartz which turns around in horseshoe form at the east end of the 300 level, and is the eastward dipping ridge of the anticline, as it will show on a level.

Passing through that body of quartz, we find the Siebert fault, as it customary, near the summit of the anticline in contact with it. A raise has been d-iven upon the fault, which I under-
544 stand has been called raise 302, and connects up with a very old raise which is driven along the fault itself practically its entire length.

Following upward along this old raise, we trace the fault in the Midway andesite or cap rock, and at very short intervals is seen passing westward along the drift which is marked 202 on this map, and we follow it continuously along that drift, or practically so, near enough so that there is no question about it.

Then going over into the MacNamara 200 level, which is connected directly with 200 of the West End, the fault is again picked up in its proper position upon drifts that are shown in that level and along and near the crest of the anticline. We follow along a drift where the two are in coincidence to a point marked M 41 on the 200 level of the MacNamara, where the vein on its strike, is shown departing from the fault—the fault is shown departing from the vein. The fault being developed in a drift 45 C, the vein is exposed running westward in drifts along which the words MacNamara 200 is shown upon the map.

Q. Leaving the plane of the fault?

A. Yes. At the level which is named upon this map MacNamara 186, the drift or level is all in the vein, except the two tip ends of it. At the west end is a fraction dacite breccia. At the east end, the vein encounters the fault. The fault, the direction of it is practically shown by the little face towards the northwest in its strike. And this is another point where the fault departs from the vein in its strike, as it did upon the cross section model upon its dip.

Passing upward, you can walk continuously through the
545 curved or a-ched stope of the MacNamara to the foot of 2 A raise. Here the fault is again picked up and the raise——

Q. A raise?

A. A raise it is called. This raise, by the way, comes up diagonally on the dip of the fault. Does not follow its exact dip. Its dip, as a matter of fact, is about as I now indicate, and in a direction almost exactly parellel with the west end north side line, and not in the direction parellel with the dip of the MacNamara vein towards the north.

Q. A diagonal upraise?

A. Yes. Then, in this immediate vicinity, it is also possible to

pass up the raise marked upon this map as a raise between 195 intermediate and 136 intermediate called 152.

Q. Let us be sure about that. I think that is marked on that other model. That is correct, 152. Kindly put your initial F, over that marking so we will know by whom it was made.

A. The fault is followed up that raise, also followed eastward down along a very high cross cut, in the back of which the fault shows for most of the distance along the edge of a drift shown in green here, 195 intermediate, and backward to the point of beginning through which I started to make this tracing of the fault. But going upward from the 195 intermediate, it has followed up the raise to some little intermediate levels numbered upon the map 136, intermediate 166, intermediate 195; they are a continuation of the same level. Strike that out. 195 is not a part of the upper working. 172 inter-
546 mediate. The 136 and the 172 intermediates connecting with the Porcupine shaft, and upon the little levels shown upon this model and marked 166 and 172. The fault is shown passing up to 136, where it enters the fraction dacite breccia. The vein entered by other raises from the 195 level is shown to pass a long distance below the dip of the fault separated by an interval of 50 feet or more of the hanging wall rock, and is shown passing up and entering—the fraction dacite breccia.

The fault is also shown cutting into the fraction dacite breccia, and showing that it is younger, even, than that rock. So the
547 fault is found at many points to depart on its dip and strike from the vein, and it is so found at the majority of points.

Q. Will you select from the different cross section-, which I understand from you are drawn one hundred feet apart, paraliel to each other, the section which most clearly shows or in which it is demonstrated, the displacement of the rock by this fault?

A. Yes, it is shown very well in section No. 2,—the displacement of the Midway andesite.

Q. Have you a similar section on drawing paper?

A. I think so. (Producing section.)

Q. This is a reproduction of section two as shown by the glass model?

A. Yes, it is identical with the glass model.

Q. Will you take that section and explain to the court the result of the fault and its dislocation of the rock?

A. First, it might help to explain, that the cross section passes in a northerly and southerly direction, not far away from the McQuillan shaft, across a number of workings and the 400 level of the Jim Butler, and is in about the position indicated here upon the model. The workings in the Jim Butler to which I refer being where the pointer rests. The Midway andesite is shown in those Jim Butler workings which are marked 400 Jim Butler upon the cross section,—shown just a very few feet away from the plane of cross section, running along the roof of the drift, and there is a considerable development of it showing its form and its dip. Other workings near at hand also show that it has near this point a dip, first towards the south and then turning up towards the north; on the other

548 side of fault, on the other hand, on the north side of the fault, we find the Midway going down the McQuillan shaft to a certain point, which is, as I recall, similar to the point indicated by section-B of the defendant. It is also shown in the back of 5-A raise, and a great number of points in this immediate vicinity show at the top of the raise, upon the West End 422-A, as I recall,——

Q. B?

A. 422-B. driven upon the Fraction vein up to the Midway Andesite, showing that the configuration of the Midway Andesite on each side of the fault is similar. The amount of displacement by the fault is therefore determined on this cross section between the points A and B.

Q. Mark for identification "Finch-3."

A. (Indicating.) This cross section is confirmed by similar cross sections at other points in the mine, so that there will be no confusion about that, so that there will be no possible confusion, it might be better to put the A on the other side of the fault, showing the amount of throw on the contact between the Midway Andesite and Mizpah trachyte.

Q. Will you kindly bear in mind that Judge Dickson is a little hard of hearing.

A. Yes. Shall I repeat that.

Q. Yes.

A. Showing the amount of throw on the contact between the Midway Andesite and the Mizpah trachyte, which is one of the best lines of reference that can be found in the ground a contact between two rocks.

Q. Now, can you recall the particular section with reference to our system of marking the sections where this same condition may appear?

A. Section No. 1 is an excellent development of the same thing.

549 Q. That is one hundred feet to the east of this section is it not?

A. Yes, that shows the raise,——

Q. Mark that "Finch-4" please.

A. (Witness marking exhibit.)

Q. That is a reproduction of section one in the glass model?

A. Yes, identical, except that the glass model is a little nicer in its drawing. The lines are the same however. The raise to which I refer and pointed out on the skeleton model as having been driven by the West End company, up to the point where the Fraction Vein runs into the Midway Andesite, is extended to some distance in Midway Andesite towards the east, and the section crossed it at such a point and shows the contact of the Midway Andesite with the Mizpah Trachyte, and also shows the dip of the trachyte, an almost horizontal dip taken as an average between the dip shown at the top of this working, and the dip of it to a certain distance towards the south in the Jim Butler near at hand; the top of 488 raise,—not numbered upon this section but referred to upon the model as the raise starting in the hanging wall trachyte stringer zone,—develops the bottom of

the Midway Andesite resting upon the Mizpah trachyte on the hanging wall side of the fault; that is another case *there* the definite throw of the fault is shown in a north and south direction, as it was in the Exhibit marked "Finch-3" and I have upon the same lines A-B on this cross section marked the points indicating that throw.

Now, it might be well to explain in that connection that this is not the greatest displacement of the fault; it- greatest displacement is naturally in the direction of the fault. These are only components of the throw of the fault measured in a north and south
550 direction, where the throw or displacement is almost the least throw or displacement caused by the fault.

Q. In other words you have to have two components to determine the extent of the throw?

A. Well, there is a direction of greatest displacement, which if measured along the fault, is measured in the direction of the movement; a cross section if taken there in any other direction shortens the amount of that movement along the plane of the fault.

Q. Well, in order to determine the direction of the movement, how many components is necessary,—the direction and extent of the movement?

A. If you take no striation to a great number of points where displacement is shown, the longest displacement shown would be the nearest to the direction of the movement.

Q. Where do you say that the greatest indication of movement and dislocation of the rock is shown?

A. It is shown by the direction of the striation.

Q. Where?

A. Almost at every point where the fault is developed. We have no developments that I can recall, which would show definitely the amount of displacement along the direction of the throw of the fault, but we do know that the amount of displacement is greater than the distance measured from A to B on this cross section.

Q. Now, have you anything further to suggest by way of the observed facts in your mind to determine the character of this fault or its relative position, other than what you have testified to?

A. There is only, if I may be permitted to use a study drawing, which I have used in the preparation and suggesting the preparation of the geology upon these exhibits,—I can show another
551 incident which is a little more comprehensive.

Q. You may—anything by way of illustrating your testimony, Mr. Finch.

A. (Witness producing drawing.) This is not a complete map, but one,—for the moment I would like to bring that up here. The light shines upon it so that the court cannot see it at all.

Q. Mark that "Finch-5."

A. This is a plan of the 400 level of the West End and the connecting level on the McNamara side; it is represented on the main plan map, Exhibit 1, in the red coloring, and can be followed around in the horseshoe shape on the map. This is not an absolutely complete map, because it does not embody the last surveys, but which were merely matters about minor details, but it does show the form

of the anticline as it appeared on the plan map, and is developed continuously from a point in the Tonopah Mining Company property around through the McNamara and through the curve on the 400 level of the West End. Now the Siebert Fault is shown in the heavy blue line, meeting the main vein for a little distance in the vicinity of the McQuillan shaft. Then this trachyte hanging wall is found for a distance beyond that; the trachyte hanging filled with stringers. Then it meets the vein again and then little segments of vein, little areas of trachyte showing that the vein,—the form of the vein, had already been made and its irregularities out into the country had already been formed before this fault cut along. Then, at a point marked on this Exhibit "T-16" is another exact point of the departure of the fault from the vein and at this point leaves,
552 takes its departure forever, as far as we know in the area of this map, from any coincidence with the vein. The Tonopah Mining level is a short distance, about fifteen feet below the MacNamara level, and a zig zag line has been shown that they are not at the same elevation; the vein is shown again on the Tonopah Mining level, marked red at T-13, a distance of over 100 feet in a cross cut to the east, is necessary in a cross cut, before the Siebert Fault is exposed, and that is a similar point to that to which I have previously referred as a point where the Midway andesite dragged down toward the south in the Mizpah trachyte; and that illustrates, I think, about all that I can say of the relation of the two.

Q. Is there anything, Mr. Finch, in the fillings in that north side of the anticline and the south side, that would indicate any different period of mineralization?

A. No, I did not notice any; I saw a great many things to indicate exactly the same period of mineralization.

Q. Will you compare the conditions existing on the vein, as exposed in the underground workings on the south side of the anticline, and on the north side?

A. They contain the same vein quartz on both sides,—contain the same silver minerals and have the same appearance.

Q. How is it with regard to the size of the vein?

A. The size of the vein is quite variable, shown upon any individual cross section which may be produced, on both sides of the vein,—but there is no difference in general between the two sides; the same character of hanging wall, where the hanging wall has not been cut out by the stopes; the same character of foot wall where the foot wall rocks are the same.

Q. You say where the hanging wall has not been cut off?

552*a* A. Where the hanging wall stringers had not been cut away from the vein.

Q. Do you find a line of demarcation, of hanging wall, a clean cut separation in the nature of a gouge, representing the hanging wall on either the north or south openings of the vein?

A. There is no definite hanging or foot wall for this vein at any point; so far as the miner is concerned he doubtless refers to the hanging wall of his *of his* ore at certain points, and they may call that the hanging wall, but in all these stopes that I have seen in the

West End, or the MacNamara, where these Siebert Faults do not open up the tops of the stopes, there is a continuation of vein matter which the miner will not take out and sell because it does not assay enough, but that is just as strictly a part of the vein as the ore itself.

Q. Without any line of demarcation between them?

A. Yes. There is sometimes a certain line of demarcation between the stope,—that is taking the northwesterly portion of stope one, which has been referred to as the MacNamara stope, and which crossed over the ridge in the West End,—now there is a stope which has a sort of wall, but there is no gouge upon the wall; it is a hard rock surface, and the ore which the miner broke, broke with the wall and it is the same both sides of the ridge; down in the MacNamara that is the characteristic wall of the stope.

Mr. Dickson:

Q. What is its characteristics?

A. A hard rock wall; a parting without gouge in appreciable quantities and without gouge which compares with gouge in the faults such as the Siebert fault; down in the southeast corner of Exhibit-1 the large stope in the vicinity of the 500 level and upward continuously, contains the same sort of wall a hard wall
552*b* off which the ore breaks, and beyond that more vein, but an indefinite boundary which has not in many places been developed; there are certain bands in the veins on both sides of the roll; in the MacNamara there is one case in which two bands of ore are stoped, one above another, and an intervening layer, a great part of the vein left standing. In the Jim Butler workings there are bands as represented upon Section No. 2 in the glass model, and more than one band developing continuously upward to the 400 level; now one of these bands is up in the trachyte and another is a very definite band and sometimes very rich to all appearances, which follows exactly on the West End rhyolite contact of the Mizpah trachyte; so, these bands of solid trachyte are commercial ore, and are identical features to the top of the incline, and pass from the top of the incline and intervening between them are these same stringers which spread out in the hanging wall and in the foot wall.

Q. Have you anything further to note with reference to the characteristics of this vein, with reference to its habit?

A. I might state that the boundaries of the vein are, as I suggested somewhat obscure, until within the proportions of exhibits, such as exhibit-2,—it is necessary to take a certain arbitrary line which we believe and it was purported to be a fair line of demarcation of a considerable amount of quartz, and there may be quartz extending beyond, and it may include some areas as included in the lighter color upon this exhibit, marked "Finch-5,"—some areas which contain quartz and trachyte mixed, and yet within the walls of the vein, because it is very often bounded on both sides by streaks of ore. The model Exhibit-2, of necessity, since it is impossible to represent upon that the little details shown on an exhibit
552*c* such as number two, the vein is represented in solid red.

Q. Represents the excavations on the vein?

A. Yes. Where in that section it exhibits the solid red is only carried in the solid part of the quartz, and the criss cross for the less mineralized parts of the vein.

Q. Well, is the result of the Siebert Faults with reference to the scoring or contact with the upper section of this vein, correctly delineated on Plaintiff's Exhibit-3?

A. Yes, it is.

Q. And that is the deduction from all the exposed data?

A. Yes.

Q. Do you find anywhere along the anticline, or in the neighborhood of the anticline of this vein, any indication of a separation between the two parts or a movement in any direction between the north and south legs of the vein,—show a cleavage between the north and south parts?

A. No; the only thing that is shown is well illustrated upon section No.-2; this vein has had a long geological history and, as I stated it has passed through several volcanic eruptions, and it has naturally been shaken up somewhat, and all through the mine there are little cracks and crevices and little slits which have not been a disturbing factor to the miner, but which do dislocate the quartz body a few feet at a time. That is not confined to the summit of the anticline.

Q. Point out some of those conditions in the workings of the West End?

A. On section No.-2 there are little dislocations of the solid quartz ore streak, shown in the model on the three streaks at the summit; they amount to a foot or eighteen inches in some cases; down
552*d* in the stopes of the Jim Butler they are much more accentuated because of this line, as shown by the blue line in the west hand portion of section No.-2,—the marks "Finch No.-3." Over in the MacNamara there are quite a series of these near at hand; one of the best illustration- of that is on section No. 6; I have not a separate sheet of that, but Judge, I can show you here. (Indicating) section No.-6; do you see the little blue line run through the vein which is displaced a maximum of three feet through that region, and as little as eighteen inches or so, and over and over again every few feet quartz with little cracks in it, caused by fissuring, by cross fissuring. Section No.-5, a stope very near at hand, shows those little fault seams, shows those little fractures, earlier than the Siebert fault, and cut off by the Siebert fault, running up in a westerly direction along the stope as I now indicate it. The actual cutting off of those cross fractures by the Siebert fault is shown in that stope in a number of places.

Q. You are now referring to a stope which you may mark "Finch Exhibit-6" which is practically a reproduction of section-5 of the glass model?

A. Yes, it shows the same series only not quite so many of them. To make the statement comprehensive in the extreme, this is the same as section No. 13 in the glass model, and I shall not say anything about it which could not also be said about the glass sheet. There are also little cross fractures in the MacNamara stope at that

point and in the region here indicated upon the plan map of the stopes. On section 13,——

Q. Mark that "Finch-7."

A. (Indicating.) Now, this cross section then indicates another feature of some interest indicates another undulation of the vein on its dip; the cross fractures there have not been a source of any considerable disturbance to the miner in his stopeing, and they do not entirely displace the vein; the vein is practically continuous and can be followed with no difficulty whatever, notwithstanding the fact that there are throws of ten and as much as fifteen or more feet by those slight dislocations.

553 Q. Now, Mr. Finch, I would like to take you to the western terminus of this vein, as I understood your explanation, it terminates up against the fraction dacite breccia, and at the end, or what we call the terminal edge of the vein occupied at one time the position of an outcrop exposed to the surface. I wish you would explain that condition, and in making the explanation, instead of requiring me to ask question-, from time to time, if you determine that this is a terminal edge, and was the exposed edge at one time of an outcrop of a vein, give all the reasons why you make that statement, commencing with the geological conditions which preceded the covering up of the vein? You might refer, perhaps, to the red model, or either model that you please.

A. I will make only one reference as a preliminary to exhibit No. 2, which is the skeleton model. I have turned the model now so that the west end of it is toward the Court. It will be noted that at this west end of the model there are a number of points at which the bright yellow color is used. All those places in the workings are developments of the fraction dacite breccia. It is easy to see that from the skeleton model those workings, although they are near together, which are colored in yellow, do not of themselves construct without the aid——

Mr. Dickson:

(Q.) Do not what?

A. Do not of themselves construct a su-face which is continuous, but they are sufficient in number so that there is no great difficulty in reproducing such a surface. Much less latitude has been taken in the reproduction of this surface because it is really very

554 well developed than is taken ordinarily in the construction of geological maps.

The geological incidents preceding the development of this old surface or hillside have already been referred to, but to summarize them, they are these: a long time ago, in geological terms, a vein was formed at the base of the Mizpah trachyte. The Mizpah trachyte was exposed as a surface of the earth, and was worn down by the atmosphere, the storms, and carried away, leaving a rough topography, as we had in certain regions near at hand right now and caused by the same processes. Then, over that was scattered—over that was laid the rocks referred to by Defendant's witness as the lower cap rock, referred hitherto in my statements as the Midway

andesite, and shown upon these section exhibits and all other exhibits as the purple; shown as purple in exhibit No. 2, and marked with the initials "MA" in the cross sections in the glass model. After this rock had been laid upon the ground, another long period of erosion took place in which the hills and ridges and slopes were formed, and incidentally to that long period of erosion, a hillside was formed sloping towards the south west, and that hillside is reconstructed upon the block model in the surface which is colored yellow.

The data for the construction of that surface is considerable. Although in this model, for purposes of simplicity, and for other reasons which I will later state, as it then existed before any of the considerable fauiting took place, has been reconstructed. It is approximately correct, and below a certain line about where I now
555 hold the scale, it has not been disturbed materially since it existed in the form shown upon the model.

Below that line which I have indicated, which is roughly the line of the Siebert fault, is the outcrop of the vein. This outcrop has not been disturbed except by such little dislocations as these which are shown at varying points in the cross section. Those little dislocations on this scale of model have been ignored, because the continuity of the vein has not been affected by them.

It is found in the mine that raises—well, first, it is found that a great many developments in the mine have been extended along the vein until they have encountered the meeting point of the vein with the fraction dacite breccia. Those I shall have to point out on the maps, or upon the model, which is equally good for that purpose. The porcupine shaft is sunk in the fraction dacite breccia. The level marked 236 upon the model, the upper level from the Porcupine shaft is run in the fraction dacite breccia. The two little levels indicated upon the map are also run into that, but they were evidently developed by raises upon the vein which show points where the vein meets the fraction dacite breccia, and develop it for considerable distances along its actual outcrop under the fraction dacite breccia. Downward in the mine there are other workings which extend up from the roof of the stopes, or from levels which pass through the vein and up out of the wall of the vein into the fraction dacite breccia, showing how thick it was at certain points over the hanging wall of the vein back in this easterly direction away from the outcrop. Such points are, for instance, raise 250, as marked upon ex-
556 hibit 1.

Another point of very considerable interest is down in the stope between the 300 and 400 levels of the West End, where the fraction dacite breccia rests upon the actual hanging wall of the vein. There are other points down along a certain line towards the southward which indicate that along this particular line there was a gulch.

Mr. Dickson:

(Q.) Can you point that place out on the map?

A. That shows very nicely on exhibit 2, where the yellow band

is shown along the top of the stope. The configuration of this surface, after using all the points of developement, such as at the west end of the 500 level, where the yellow is shown on exhibit 2, the west end on the 600 level, and the tops of the raises, for instance, in 440 raise, driven upon the so-called south vein, and under the surface of the fraction breccia, as developed, and therefore the form of the surface indicated before the fraction breccia was deposited is shown. The little gulch as indicated flows down and uncovers the vein back in the old Midway rocks and along the gulch which flows down in a general direction toward the west end of the 600 level. And the outcrop itself is shown in the red line upon the model.

Mr. Lindley:

(Q.) As I understand you, that outcrop is not the result of faulting or exposure of that, but the result of ordinary erosion?

A. Yes, and the reasons for that are these: at every point where the end of the vein, or terminal edge of the vein is found in contact with these loose, fragmental fraction breccias, the vein is
557 found stained as the result of oxidation by exposure to the surface of the earth, just precisely as outcrops up along the Mizpah were stained at the time when the district was first discovered.

Q. You hold in your hand that piece of rock, a sample which—have you identified it by number?

A. No, I am using this rock merely as an illustration. I do not know whether it even came from this or not, but it does represent the stain which quartz has at the outcrop of a vein.

Mr. Dickson:

(Q.) Where did this come from, do you know?

A. I don't know.

Mr. Lindley :

(Q.) You are using that simply which you are now marking as "Finch 8" as an illustration?

A. Yes. I am marking it "Finch 8" upon the quartz.

Q. You do not know where that particular sample came from?

A. No.

Q. You are simply using that as a sample of oxidation where a vein is exposed to the surface?

A. Yes. That oxidation extends for a considerable distance into the vein, a distance which is the reasonable and proper distance for such oxidation to extend from any surface of a vein. Certain workings—for instance, at the west end of the 600 level and in the 300 level of the west end, where it is shown here a stope ends, and the yellow color begins around a curving drift over toward the Ohio mine, at that point and in the 165 level and in 173 level, the broken, shattered, stained outcrop of the vein in place is shown, but
558 more than that, the float which existed on the surface of the earth when this volcanic eruption covered it is seen lying down and scattered below the solid outcrop.

Q. And included within the later eruptive rock?

A. Yes. The development of it, I might say, is as vivid as if it were on the surface at the present day at these points.

559 J. W. FINCH.

Further direct.

Mr. Lindley:

Q. You were describing the oxidization of this ancient outcrop. I will ask you to state whether or no you observed that oxidized condition of the quartz in any other section of the mine?

A. Yes, there is oxidization in certain points where *where* there should be.

Q. Where is that?

A. On or near the base of the Midway andesite in places where there was also a surface exposed at one time; some oxidation down in the McNamara region, where we are near the old sub Midway surface; and in the vein in all that region where it is buried by any thickness of Mizpah trachyte, and where there was not a surface there was no such oxidation.

Q. To what extent does that oxidation appear along the line of this original outcrop?

A. At every point where this original outcrop has been exposed, and it appears in a very marked degree,—I have picked up another specimen which I will mark "Finch-8" if you do not object.

Q. No, we do not object. Where did that come from?

A. I do not know, it shows a fragment of quartz where the vein ceased to be a vein in place, and where it begins to be a mixture of float and loose rock and cemented together by the usual cementing material near the surface.

The Court: That should be "Finch-9."

A. Finch-9, (marking same) and as to the extent of it it is very marked everywhere, where the buried outcrop is exposed, but probably the intensest iron stain is at the 600 foot level near the west end of it, and that the deepest point below the present surface of
560 the earth, where the condition has been developed in the mine. In other words, if I may be able to pass to a conclusion from that, the oxidation in no respect shows that it is an oxidation produced by present conditions, but that it was formed before the Fraction dacite breccia was formed, and it is quite, or in this particular case, more prominent at the deepest point where it is developed, and where sulphide ores are fresh; moreover it is a sort of oxidation which is only produced by the downward effect of surface water, and is not, could not be produced by any explosive eruption of a volcanic neck, because such eruptions do not oxidize veins.

Q. Could it be produced by the downward circulation of meteoric waters.

A. Yes, and it evidently is conclusive that it is not.

Q. In other words it took atmospheric conditions to place it or surface waters?

A. Yes.

Q. Did you notice any such oxidation in the series *or* raises, testified to by the defendant's witnesses, raises two to seven-A?

A. No.

Q. How about Raise-A up in the McNamara stope?

A. The rock is fresh there; the rock is quite fresh there, very little oxidation, although at the top of it, as I remember, there are a few little stringers with some stain in them, because it is only a few feet away to the base of the Fraction dacite breccia; the contrast between oxidation in this outcrop, or any of the vein, or these unoxidized rocks, is closely grouped a series of veins, indicate clearly,—illustrate the difference between a rock that has been exposed to the surface, underlying the cap rock at the present time, and a rock which underlies a cap rock, which has been brought down by a fault,
561 where no conditions of oxidation have existed at any previous time.

Q. I will ask you to state Mr. Finch, whether or no, you encountered in any of the workings of the West End or McNamara Company, the terminal edge of that vein or any terminal edge, or if more than one, state them?

A. In the McNamara the same terminal edge is shown north and northwesterly beyond the north side line of the West End claim, well exposed at a point shown upon the model, and exposed at other points along the summit of the stope at the extreme northwest corner, and on the map, where the stope has been carried up to an outcrop against the Fraction dacite breccia, and still over to the west, along workings I have been accustomed to call the Ohio workings.

Q. That is in the California claim?

A. That may be.

Mr. Lindley: Is that right?

Mr. Dickson: That is right.

Mr. Lindley: It belonged to the Ohio Tonopah before it was owned by the West End; it is the same thing, it was formerly owned by the Ohio company. It is the California claim?

A. A long cross cut is driven westward from those workings, which follows pretty close to the contact, a cross cut driven back and disclosing it, and it is shown in a great number of points in that region.

Q. Is there any other exposures of fracture in the vein in the West End ground, that corresponds to your idea of a terminal edge except this exposure?

A. There is no terminal edge except the one that I have described and exposed at any other point in the West End.
562 There are slight dislocations which are not terminal edges, because the vein passes, and can be traced through and past them without interruption.

Q. Well, if we accept for the time being and for the purpose of this investigation or your examination, that the apex of the vein is the terminal edge, from which there is an extension downward,—is there anything shown in the West End mine, which will correspond

to that suggestion of terminal edge with downward extension? If so, will you please explain to the court and counsel what it is?

A. A very oxidized outcrop, buried by the Fraction dacite breccia, is but a terminal edge. It is exposed first, at a point across the north sideline of the West End claim, at a distance of about 175 feet, measured from the northwest corner of the claim, along the north sideline of it; it is developed at a point very near the line, so that this distance which I measured is reasonably accurate. It is shown near the south sideline of the West End claim, developed in the west end of the 500 level, and so near the line that it is reasonably accurate to state that it crossed the sideline a distance of 200 feet, from the southwest corner, measured along the sideline; that is as to the direction.

Q. Go on with your explanation there with reference to continuing those two factors of terminal edges and downward course, and explain the situation as you understand it, upon *to* your model "Plaintiff's exhibit-4" with reference to the direction of the sidelines of the West End claim.

A. The buried outcrop across the lines at the points just described and as shown upon model "Exhibit No. 4" the glass model, and from the development underground, has a curving direction
563 across the claim; it dips from the point where it enters the from the development underlying, has a curving direction because the West End claim at this point is located on the slope of the anticlinal roll, and the direction of the dip is the direction approximately which I am putting upon the block model now.

Mr. Dickson:

Q. Give us the course in degrees and direction.

Mr. Lindley:

Q. As it may have several lines of dip I suggest that you mark them A, B, C, and so forth. Proceed Mr. Finch.

A. The direction of that dip line just placed upon the model being a local dip line, starting from that arbitrary point where it passes the sideline, is about north ten degrees west.

Mr. Alling:

Q. How is that line marked upon the model?

Mr. Lindley: Marked with an arrow and a letter "A."

A. The arrow is pointing to the letter "A" on the model. It is about north ten degrees west; it would be southeast in the direction of the dip; well, it will be seen upon the black model "Exhibit-4" that it lies within the vein, this line which I have drawn and will continue to lie within the vein across the West End claim, and on beyond that point; it makes an average of some thirty degrees of an angle within the vein as measured between the line of outcrop and the line of dip downward on the slope of the vein.

Q. That is the local dip, at that point?

A. Yes.

Q. Now take the vein as a whole and give us your determination as to the dip there with reference to the side-end-line claim?

A. The direction of the dip—the real dip of the vein?

Q. Well, I am not speaking now of the mathematical dip.

564 I am speaking of the downward course with reference to the plane of the sideline.

A. It has a downward course with reference to the plane of the sideline, which can be indicated as starting at the same point, and its downward course will be followed by the north sideline of the West End claim, which we can convert into an arrow,—the dip being similar in degree.

Q. In other words leaving out the technical relationship of strike and dip, and speaking of the conditions shown in the ground, with reference to the plane of the sideline, is there a downward course from all points that the plane of that sideline cuts the vein, and if so, in what direction is the downward course?

565 A. It is a downward course, slightly flatter than the local dip marked "A," but nevertheless a downward course which would not be less than,—a dip in degrees which on this downward course would not be less than 20 degrees, I should estimate it. I will mark that, if I may, "Side line Dip" to distinguish it, as in the other case, from the real average dip of the vein.

Q. Mathematical dip?

A. Yes.

Q. Taking the vein as a whole as it passes through the West End ground on its strike across the end line,—the course of the apex across the end-line, what would you say was the course of that apex?

A. As it passes through all this territory?

Q. No, I am speaking now of the West End only?

A. The average of it, of course, if a straight line drawn between the two points where it crosses the north side-line and the south side-line of the claim. And, so far as I can get it, with the appliances for the purpose now at hand,—I will have a straight-edge, if I may, that will reach clear across—the direction is about North, 5 degrees East, and that is a course or direction of the outcrop, and not a strike.

Q. The strike is, of course, on a level?

A. Yes.

Q. And I should judge from your model, therefore, that it is ascending up a hill-side?

A. Yes.

Q. Had rather a plunging course from the summit down?

A. Yes, as is very well shown on Exhibit 4.

566 Mr. Dickson:

Q. North, 5 degrees, east, was that?

A. Yes.

Mr. Lindley:

Q. Well, I understood you to say, however, that there was no other terminal edge of any kind, side, top or bottom?

A. No, not in the West End claim.

Q. So then, this exposure which you say was the buried outcrop?

A. That is the only one where the vein ends and in this development does not continue onward through unknown distances outward from the West End claim.

Q. Taking the vein as a whole, as developed in the workings of these companies, I wish you would explain to the Court the relationship of strike and dip, and the situation generally, with reference to the vein as a whole.

A. In discussing mathematical terms, such as strike and dip really are, it is some times difficult for those who have not had considerable practice in mathematical forms, geometrical forms, to comprehend the line of dip or of strike of a curving or irregular ore body. For that reason I should be very glad if I might be permitted to show in a graphic way what the strike and dip mean, as applied to a vein, straight and an irregular one.

Q. You may do that, Mr. Finch.

A. One of the essential elements in the definition of strike, and, therefore, of dip also, is the determination of a level plane. It is a well known fact that a surface of water is the best level that nature affords. If the surface of the water, which I show in the pan, which will be a little difficult to mark as an exhibit,——

567 Q. I suppose if you have any other kind of liquor, which they have in Tonopah in there, you will have the same difficulty.

A. If we insert in this water a sheet, plain sheet, such as I hold in my hand, the line along which that sheet meets the water is the strike of it, if it were a vein. It will be observed if I do not change the inclination of it that I can move that sheet around in the water, and that line does not change. Consequently, the conclusion begins to arise at once that if this straight vein is not a straight vein, but a curved vein, the strike in that level plane would be a curved line. If we place in the water a curved surface, such as this, which may illustrate graphically in a more or less geometric form the incline or roll of the vein under discussion, we will see if we insert that sheet steeply into the water that we will have a certain line developed which I shall proceed to mark, as nearly as I can, along the surface of the water.

It will be noticed that that line is a curved line, but that it is identical in its curve with the curve of the surface.

If, however, we insert this,—have to have a little more water,—if we insert the sheet of metal at an inclination, comparatively steep inclination, there will be another curve formed, which as you look down upon the water, is more of a curve than the one which was drawn before and does not conform with the curvature of the sheet of metal. I will mark this curve No. 2 and the other one No. 1.

568 Now, we will find if we insert this metal,—if we insert the curved sheet of metal again in the water and make it lie flatly in it, that we produce a curve which is quite strikingly different from the curves formerly drawn, being a curve with a somewhat sharp point. Now, that is more like the curve that we actually find in the strike of the West End-MacNamara vein, coming to quite a

sharp point. Nevertheless, as the vein exists in the ground except for some of the top hanging-wall streaks, it is not a sharp curve. Some of the sections which show the foot-wall part of it show that the curve of this vein, of its dome, is even flatter than the sheet of metal which I hold in my hand, and yet the general strike of it which connects all around in a level surface, such as a level surface of the water, brings out a comparatively sharp point of what might be called the toe of the anticline on any particular level.

Now, just to illustrate the matter of strike a little bit fur*h*ter, the only case in which this anticline would not have a strike which runs in a northerly and southerly direction would be when it lies absolutely horizontal.

Mr. Dickson:

Q. Would be what?

A. When it lies absolutely horizontal. In that event, there would be the appearance on any level which might be driven on the two limbs, or slopes, of the anticline, there would be two parallel lines as are now shown as it is immersed again in the water. The strike of it would then appear to be east and west. As a matter of fact, for all practical purposes, it would not have any strike at all because, as a whole, on an undulating surface it would be a horizontal
569 body.

Now, the dip of a vein, such as is illustrated by the sheet of metal, is parallel with its edges, if it is symmetrical, and if it is symmetrically curved and the top of it is directly down the ridge or summit of the curved sheet. That is, the average dip, that is the dip anywhere, the true dip of the sheet as a whole. The average strike of this sheet of metal, take the last line I have drawn where it comes to quite a point, the average strike is a line connecting the two points of beginning at that horizontal water surface when the sheet was immersed in the water. That is the average strike.

Now, applying that to this vein, the sheet of metal, if the foot-wall were represented instead of the hanging-wall, the sheet of metal would have about the curvature of the West End-MacNamara vein. Its dip, as a whole, within the limits of this model is downward along the crest of the ridge. Its average strike is the strike which any horizontal line would show.

For instance, if you moved up the model about 3 inches,—about 2 inches, you come to the region of the 400-level, in which level is developed a curve about as I now trace with my pencil around the vein, and it corresponds approximately with the,——

Mr. Dickson:

Q. Now, what do we understand you to be the average strike there?

A. The average strike there on this model would be between the two points where a level run would pass around this surface as a contour.

Mr. Lindley:

Q. And the general direction of that would be what?

570 A. The general direction would be northerly, or somewhat northeasterly, in a direction across the West End claim.

Q. Now then, to determine the average strike of a vein, you would connect the two exterior points?

A. Yes. It could be illustrated on this plan map. If that map were extended a little further,——

Mr. Dickson:

Q. In what direction?

A. In a northerly and northwesterly direction, it would take in workings of the MacNamara over to a point which would be due north of the West End, of the 500-level. And a line drawn along the vein around the end, or around the sharp curve or prow at the summit of the incline would be turned into such a position in the MacNamara workings that the strike of the vein, averaged, would be almost due north.

Mr. Lindley:

Q. That situation is practically exhibited on cross-section "C," I think, of the Defendant's Exhibits?

A. Yes.

Q. A cross-section showing the 400-level which extends,—I mean the horizontal section or plan map of the 400-level of the Plaintiff's exhibit; call that section "D."

A. Yes, that section exhibits it in this way: If you take a vertical slice down through a ridge, symmetrical ridge or a hill, and any cross-section which shows that the two slopes are equal from the summit, and there is a plunge of the slope, then a line drawn as a contour around that hill, meeting at equal distance from the summit will give the strike; and the average strike will be a point connecting the two ends and will be in the line of the section; and in this instance, it would be north and south.

571 I am placing, if you will permit me, Judge, upon Exhibit No. 4, the block-model, another line drawn as well as I can in a free-hand way, showing the average dip of the body as a whole represented in the model, and will mark that "C."

Mr. Lindley: Possibly there may be some few questions I may want to ask, but otherwise, for the present, I turn the witness over to you for cross-examination. If anything occurs to me, I will have the privilege of asking?

Mr. Dickson: Certainly. Well, I do not wish to proceed with the cross-examination, until the direct is closed.

Mr. Lindley: Well, we close it.

The Court: Are you going to continue quitting time at half past four?

Mr. Dickson: I suppose so.

The Court: Well, we might as well stop, then.

Mr. Lindley: If I have some more questions in the morning we might as well close. I do not think I have anything further. If I do, I will ask them in the morning.

The Court: This case is continued until tomorrow morning at 10 o'clock.

572 13.

Seventh Day.

TUESDAY, December 15th, 1914.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Mr. Lindley: I would like to state to the court and counsel that there were one or two matters that had been omitted from our model, that has been added during the recess.

Direct examination of JOHN W. FINCH resumed.

Mr. Lindley:

Q. Will you point them out Mr. Finch?

A. There has a stope been added which shows in a slightly brighter red in the model No. 9-A, being the MacNamara stope lying between the MacNamara 200 and 300.

Q. That stope has been prepared but omitted to be put on?

A. Yes.

Q. Overlooked it?

A. Yes.

Mr. Lindley: That same stope is on the other model?

A. Yes.

Cross-examination.

Mr. Dickson:

Q. What kind of a vein is this, Mr. Finch? How would you classify it?

A. Contact fissure vein.

Q. What is your opinion of the process agencies by which vein-, metallic veins are formed, and their ores deposited?

573 A. There are several steps in the process. The first requisite is some avenue of circulation in the rocks? That may be caused by fissuring, may exist sometimes on a contact without any dynamic force to cause a fissure, or it may be both. Then the openings through the rocks having been created in more or less sheet-like form through the rocks.

Q. More or less what?

A. More or less sheet-like or tabular forms through the rocks. The next step is the circulation of the solutions carrying the material which goes to make up the veins, non-metallic materials, such as quartz and metallic materials such as pyrite and the commercial ore minerals. Those are deposited in the opening in the rocks.

Q. In your opinion, I do not mean speaking universally but speaking generall- is it your opinion that circulating solutions from which the minerals have been deposited in veins comes from some deep seated source of ascending solutions?

A. I think that the solutions in this instnace, in this place formed this flat contact vein——

Q. How is that?

A. I think that the solutions which formed this flat contact vein were ascending solutions, at least in the sense as distinguished——

Q. I am not speaking of the earliest mineralization in the way of silicification.

A. I do not think that there is any difference in the process which caused the silicification and replacement of the rock, and the process which deposited the commercial minerals.

Q. In your opinion was there silifici-ation of the rock carried on to some extent here before the metals were deposited in the form of ore bodies, as we have them today?

A. Before, or after, or at the same time.

574 Q. You have no opinion about it one way or the other?

A. It might have been both before and after.

Q. Do you not think that there was sili-fication of the rocks, enclosing rocks of this vein that preceeded the deposition of the ore and metals, gold and silver and whatever else there may be in there?

A. There are parts along the vein of a replacement of this wall rock by silica, which is older than some of the streaks or bodies of commercial mineral. But it is not certain that that process of silicification ended before the other minerals were started.

Q. It may not have been completed before?

A. No.

Q. But it was commenced before?

A. It is coincident process.

Q. What?

A. It was a coincident process in my mind.

Q. Do you not have north and south nearly vertical fissures lying between what we call the two veins at the crest and for some distance below the crest, with a north and south strike, sometimes practically a vertical, sometimes a dip to the east, sometimes a slight dip to the west, in that intervening country?

A. We do, but,——

Q. And do you not find those——

Mr. Lindley: One moment Judge, he was starting to answer that question. He said "We do, but"——

A. But if your question involves any connection with preceeding questions, that these fissures had any connection or causal relation with the deposition of the ore, I shall have to make an explanation of what they really are.

Mr. Dickson: Go ahead and make your explanation.

575 A. Along the summit of the anticline, and at other points where the Siebert Fault plane comes down and impinges upon the vein, there are certain cracks formed. And there are cracks formed just precisely as would be expected from the over riding mass of rock which moved northeastward over this vein, they run transversly. They are seams or wounds made

in the vein by the over riding dragging rocks, they are transverse clear across in the direction of that movement. Now I say that they have no relation to the genesis of the ore because we find in those seams fragments of the Midway andesite which have dropped down into the quartz of the vein. They were therefore, formed after the Midway andesite. Places of that kind can be found, as for instance, in the vicinity of M-43.

Mr. Lindley: On Plaintiff's Exhibit 1?

A. On Plaintiff's Exhibit No. 1 on the MacNamara 200 level, where the fracture is at some distance from the Siebert fault, and underlying a natural contact of the Midway andesite, not brought down by the fault but resting there in the relation which it had when it was deposited by the volcano which produced it.

Mr. Dickson: I think that was a very much longer answer than was needed, either by the question or the explanation.

A. The answer was made entirely to explain that it has no relation to the process of deposition.

Q. I will endeavor to be patient with you Mr. Finch, and give you time to answer, but when you have gotten through I wish you would give me time to ask a question.

A. Yes, sir.

Q. Of course the Siebert fault was post mineral, as I understand you?

A. Yes, sir.

Q. And the entire mineralization has been completed,——

576 A. In this vein.

Q. Before the Siebert fault was open?

A. Yes sir.

Q. So it goes without saying that the Siebert fault has nothing to do with the mineralization at all?

A. That is true.

Q. Now, these north and south seams filled with silica found in the intervening rock between what we call the two veins at the crest, and for some distance below the crest of what you call the anticline, you do find north and south fractures?

A. They are fractures, but they are not filled with silica.

Q. Some of them are?

A. They are across the silica.

Q. Some of them are, are they not?

A. Only in certain places an older series of north and south veins are formed, and some remnants or traces of them can be seen. The north and south fractures, of which there are a great many down along the crest along the Siebert fault, those are of a different nature and are later than the quartz. No ore deposition in them.

577 Q. Are there some of these north and south seams, or fissures which are filled with silica, lying in this intervening country to which I have referred, that was there before the deposition of the matter which gives value to this vein,—or don't you know?

A. I know that there are older fissures down in the 500 level.

Q. I am confining your attention to the intervening country, immediately at the juncture of what we call the two veins, and which you call the dip of the fold, and for a distance of thirty, forty or fifty feet, below that crest; that is the place I am directing your attention to. Do you mean to say, that there are not observable in that country north and south fissures filled with silica, some of them forming practically vertical, some with a slight dip to the east, and some with a dip to the west, which were formed and silicified, in your judgment, prior to the deposition of the vein matter, which gave commercial value to this vein?

A. Yes, there are some fissures, but they do not effect in any way the form of the anticlinal vein as I have described it.

Q. I am not attacking your anticlinal fold,—just simply the facts. Give me the facts as observed by you, and your deductions from them; I want to get at any additional facts if there be any. I am not asking you to change your deductions or your conclusions at all. To what extent, to what degree is the vein here in controversy, the one vein as you term it, or the two main veins, as contended by the defendant, a fissure vein or fissure veins?

A. It is a fissure vein of a certain type, directed by a preexisting contact, as to its position.

Q. Wholly?

A. Directed wholly, yes, but not——

578 Q. Wait a minute. Does it follow the contact throughout, or do you have a fissure which in places departs from the contact, and cut- through a homogeneous rock?

A. Yes, but in doing so it is still directed by the contact.

Q. That may have influenced its course?

A. Directs its course.

Q. Of course, if you had a fissure cutting through in places, a homogeneous rock, and on its course or strike or dip, it approached closely to a plane of contact between different rocks, and that plane formed a greater line of weakness, it would have gone through the homogeneous rock,—it would be natural to expect that the fissure might break from the homogeneous rock, and follow for the greater or less distance the plane of contact,—wouldn't it?

A. I think that it is more rational to consider it as a,——

Q. A little louder please.

A. I think that it is more logical to conceive it as a process of fissuring along a contact, than broken through a crack or crevice to the contact.

Q. Would it be more rational, do you suppose, in your opinion, if the fissure opened or started in its opening along a plane of contact, that it would be likely to leave that plane of weakness and make out into a harder and homogeneous rock, than to suppose that the fissure being opened, started, in homogeneous rock, and on its course longitudinal or downward, where it approached closely a plane of contact, that it would depart from the homogeneous rock and follow for a greater or less distance this line of weakness found at the plane of contact?

A. That would be all right as a hypothetical case.

579 Q. Which would be the more reasonable to accept?

A. It would be more reasonable to expect that the line of weakness, which is the contact is the directive influence causing the form of the vein.

Q. To some extent?

A. And in this case we know that the great majority of points and by far the greater area of *of* this vein, *it* is found on a contact, and even in the area of the map, about fifty per cent of it is a contact vein.

Q. In your opinion would the plane of contact in which this vein in particular is found, or along which it is in part found, would be a greater line,—a line of greater weakness rather, than where you find the fissure cutting through the homogeneous rock, apart from the plane of contact?

A. Yes.

Q. Then if it was open along a plane of contact, and departed from that weaker line, that line of lesser resistance, cutting through the homogeneous rock, there must have been something to deflect it in that course, give it a course away from the line of greater weakness to a line of greater resistance must there not?

A. Yes, and there is a reason for that.

Q. Well, would we have to hunt for any reason for this phenomenon—we have a fissure we will say in a generally easterly and westerly course, cutting through a homogeneous rock for a portion or portions of its distance, and in its course longitudinal or course downward, it approaches closely a plane of contact, and there departs from the homogeneous rock and follows the plane of contact which was the greater weakness. Would not that be altogether reasonable to anticipate that it would have such a course,—that it would diverge from the homogeneous rock it had been cutting and at places follow the contact which was the plane of weakness?

580 A. It does not appear reasonable to me.

Q. Then it would not be reasonable?

A. Not under the conditions that we have here.

Q. Generally speaking, where you have a fissure cutting through homogeneous rock, and at places departing from the homogeneous rock following the plane of contact between two different rocks, would not the explanation that would occur to the geologist be, that it departed from the homogeneous rock and followed along the plane of contact, because having approached near that plane there was encountered a greater line of weakness than was afforded by the homogeneous rocks?

A. That is a question involving hypothetical elements, that I think, Judge Dickson, I could save time if I tried to explain the effect of the elements in the question. Otherwise I shall have to briefly state that under the conditions that we have here it is not a rational conception.

Q. Under the peculiar conditions that we have here it would be from the standpoint of the geologist rational to expect that the fissure was open first along the plane of contact which it followed for some distance, and then departed from the plane of weakness afforded by

the contact, and cut away from that into a homogeneous rock,—than the converse?

A. Cut across a bulging projection of homogeneous rock.

Q. How thick is the homogeneous rock underlying this ledge,—the trachyte as you call it?

A. It is a saucer shaped body, under the vein that comes to nothing in every direction, and at its greatest thickness might possibly be two hundred feet or so.

Q. Is the fissure cut through that?

A. Cuts across it, sliced it off.

581 Q. Leaves the contact?

A. It is on the contact all around that little knob which has been cut off.

Q. What do you call the contact?

A. What do I call the contact?

Q. Yes, what is it, trachyte, or what?

A. It is trachyte at all points on the top of the vein, but under the vein there is a variety of rock.

Q. I call your attention to Defendant's Exhibit-G and section D, thereon, and ask you what the rock underlying the vein is, displayed upon that section?

A. As displayed upon that section it is trachyte.

Q. Well, do you know where that plane of section has passed through?

A. Yes, I have a section almost identical.

Q. Well, now in that vicinity where that plane of section has passed, that underlying rock, that is to say the rock underlying the vein, is trachyte?

A. Yes, for a part of it.

Q. From top to bottom of what is shown on that section?

A. Trachyte under the vein, where the purple color is shown.

Q. From top to bottom on what is shown on this section-D?

A. From the summit of the anticline?

Q. Yes.

A. Southward in the Jim Butler that is true; for a short distance in the MacNamara.

Q. What is the overlying rock, that is to say, the rock immediately overlying the main south dipping vein?

A. Trachyte.

Q. From top to bottom of what is shown on that south dipping vein on that section?

A. Yes, that is true as of all other points.

Q. Is it true that there is a fissure vein coming through that trachyte and along which the ore bodies have been formed?

A. Yes.

582 Q. What *us* the course of that body, longitudinal?

A. Do you want to *local* direction of it in that vicinity?

Q. I don't want to just confine you to a mathematical term, one hundred feet or so from the plane of section.

A. The course of it is shown upon this map marked "Finch-5"

that is the south branch; they do not show the vein on your plan map.

Q. My question is, in this trachyte, which according to your testimony underlies and overlies the south dipping vein, there is a fissure in and along your ores, and mineralized vein deposited, and you say yes. Now, my next question was, what is the course or strike of that fissure that is thus cutting through your homogeneous rock?

583 A. General strike is in a northerly direction. Its local strike at that point is northeasterly.

Q. Can you give us more definitely than that? Northeasterly—do you mean due northeast?

A. Just about. I can give you local strikes all the way from north or south to east and west.

Q. You may do that in redirect if you wish. I do not think it is necessary as an explanation to the question. I would like to have your answer to the question I am asking. I will take you now to section A on the Defendant's Exhibit G, and ask you what is the rock which overlies the north dipping as well as the main south dipping vein?

A. They are not the same rocks. Oh, overlying?

Q. Yes.

A. Overlying the entire vein?

Q. Yes.

Q. Over the continuous vein, as we call it, it is trachyte.

Q. And underlying the north dipping vein and the main south dipping vein, what is the rock?

A. Another formation.

Q. What is it, I say?

A. The glassy trachyte.

Q. Is there a fissure found there extending from the top of the south dipping vein, as represented in red on Section A to the bottom of it, as represented in red, in and along which the ores have been deposited and from which mineralization has extended?

A. Yes; more mineralization extending into the hanging wall than is shown on that section.

Q. What is that?

584 A. There is more mineralization extending into the hanging wall than is shown on that section.

Q. Calling your attention to the fraction vein, so called, as shown upon this section A, what is the country rock overlying and underlying that vein?

A. That is a vein entirely in the lode porphyry, as most of the veins of the district.

Q. The same rocks above as below?

A. Yes sir.

Q. And have you there a fissure?

A. Yes.

Q. Extending from the top of the Fraction vein, as represented upon this section, to its junction with the main south dipping vein, in and along which the ores, minerals, have been deposited?

A. To its junction or intersection.

Q. What?

A. To its junction or crossing whichever it may be, that is true.

Q. I am going back again—this section A, as you understand it, is near the easterly end line of the West End claim?

A. Yes sir.

Q. And section D where we also have the fissure which you have described as near the westerly termination of the ore or the vein in its course westerly?

A. Yes sir.

Q. And there you have represented on Section D, also, what has been spoken of by the witnesses for the Defendant as the south
585 branch of the south vein. That in its upward course encounters cap rock, does it not?

A. In its upward course toward the west, yes.

Q. And when you get some distance below the top of that south branch of the south dipping vein, from thence on in its downward course is formed a junction of the south dipping vein, the hanging wall and the foot wall of that portion of the vein is the same character of rock?

A. It is, or it was at one time.

Q. What?

A. I say it is or it was at one time; some of it has been eroded away.

Q. So far as you are able to observe, it is now?

A. No, there is some Fraction dacite breccia resting upon the hanging wall of it.

Q. But the figure there—that portion of the south branch of the south dipping vein to which I have called your attention follows a fissure, speaking generally, follows downward, and we have the same character of rock overlying and underlying it, speaking generally?

A. That is true, yes.

Q. And apart from some intrusions, as I understand you, of the Fraction dacite breccia?

A. There is no intrusion.

Q. Well, we will change the question: apart from the place where you find some of the Fraction dacite breccia, that vein has the same rock for its hanging as for its foot wall?

A. Yes. In other words, there it is not a contact vein.

Q. Yes, of course, that goes without saying. What is the course of the fissure as disclosed and followed in the territory
586 through which Section A on Defendant's exhibit G has passed, from the top of the main south dipping vein to its bottom? Its longitudinal course in that locality?

Mr. Lindley: That is considering that as an individual, separate vein?

Mr. Dickson: Of course. I am not trying to commit the witness to anything that is in conflict with the conclusions he has reached.

A. You mean by that its strike and dip down through the ground?

Q. Longitudinal course, I mean.

A. That might be its dip.
Q. Well, its longitudinal course through the country would not e its dip, would it?
A. We speak of the longitudinal projection of the vein as the topeing map lengthwise of the vein it follows. It may be dip or trike, or midway between both.
Q. I am not speaking of any projection. In the country in the icinity of the place through which this Section A was passed or aken, what is the course or strike of the fissure which you say the res in the main south dipping vein lie in or follow along from top o bottom?
A. It starts in in the Jim Butler region.
Q. No, in this region.
A. Yes, in this region. In this section. It starts in south of the est end territory, in the Curtis claim and runs in a northeasterly irection. Then it turns to a northerly direction; then it turns to a orthwesterly direction.
Q. Do you think these fissures that we have been calling
587 your attention to on these two planes of section afforded a channel for the circulation of the ascending solutions which arried the metals and minerals in the solution and deposited them in nd along this fissure?
A. Meaning by this fissure the entire deposit?
Q. I am speaking now where the country is cut by the plane of ection A, or where that plane is passed through?
A. It did afford a channel of circulation at all times during the rocess of the formation of the vein.
Q. And that is true of the fissure you have referred to as being ound in the country where Section D is passed through? That as a channel of circulation for these solutions?
A. At all times, from end to end of that section.
Q. Will you point out on Plaintiff's exhibit 2 where Section A of Defendant's exhibit G was passed or taken?
A. I will have to look at your plan map. No, I can determine hat another way. It is east of the east end line.
Q. About how far?
A. Passes very near the northeast corner of the claim and a little urther away from the southeast corner.
Q. Now, in that same connection, tell us where Section B on Defendant's exhibit G was passed?
A. Section B?
Q. Point it out on the model.
A. That is just inside of the east end of the West End claim. It passes very near the northeast corner and about——
588 Q. About 30 feet west of the southeast corner would be near enough?
A. That is about it, yes.
Q. Now, will you show me where Section C on Defendant's Exhibit G was taken? About how far west of the east end line of the West End claim?
A. Section C passes near a corner where the angle occurs in the

north side line. Passes near the angle in the north side line, and about 270 feet southwesterly from the southeast corner, measured along the south side line.

Q. Now, what is the distance from—in the southerly portion, that is near the south side line of the West End claim, I do not care for just the exact point—how far easterly of Section C is Section A?

A. About 320 feet, measured along the direction of the south side line.

Q. 300 what?

A. 320.

Q. Now, along in the country where each of these three sections, A, B, and C were taken, I suppose you have a fissure in and along which the ore bodies and mineralization is found?

A. Please read that question.

Q. (The reporter read the question.)

A. Yes sir.

Q. Will you step to the model, Defendant's exhibit A, for a moment. What is the course easterly and westerly of the stopes shown upon this model from their easterly terminus before we come to any break in the ore, in the stopes, to the point where we come to the first break in the westerly end of the stopes?

A. That is just about east and west.

589 Q. Just about east and west?

A. As a local strike.

Q. And the three sections, A, B, and C, have been passed through that country?

A. Yes.

Q. And the ore which each section is taken is found to be lying in and making from the mineralization, making out from these fissures, that you have spoken of?

A. I have only spoken of one.

Q. You said there was one fissure found in Section A, along which, from the top to the bottom of what we call the south dipping vein, the ores were found; also in Section B, and also in Section C, have you not?

A. The stopes to which you are pointing are upon one vein, and the same vein is shown in the three sections.

Q. At all events, where Section A is taken, from the top to the bottom of what is represented on that section as the south dipping vein, you are following down on a fissure in and along which the ores and mineralization is found? That is true, isn't it?

A. Yes, if you do follow it down.

Q. Well, you said you followed it down?

A. You can follow down, or you can follow up; in any event you would be in the same fissure.

Q. I do not care whether you are following down or up, that makes no difference. And where Section B was taken, on Defendant's exhibit G, you followed down, or follow up on a fissure from top to bottom of what is shown upon Section B as the south dipping vein, and in and along that fissure you find the ore and the

590 mineralization, do you not?

A. Yes; except there is one thing to qualify in your question.
Q. What is that?
A. You can follow up to a certain point where you can no longer follow up, but you have to pass over and follow down again.
Q. You have a fissure all the way, and you have ore all the way?
A. Yes.
Q. The fissure, I suppose has been faulted in places?
A. Yes.
Q. Just as the ore in the stopes, those ore bodies have been faulted?
A. Slight displacements.
Q. But apart from that displacement, you do follow continuously where each of these three planes of the section is taken, a fissure from top to bottom of what we claim to be the south dipping vein, and in and along that fissure, where cut by each of these three planes you find the ore deposit?
A. There is no question of the continuity of the vein for that area which you have described.
Q. Just answer the question.
A. You can follow it along through all those workings continuously upon the vein.
Q. What is the distance to where you have the stopes taken, as you have said generally, easterly and westerly course, from the easterly end of the stope east of the east end line of the West End claim, thence westerly to where you come to the first interruption in the actual stope? Give me the distance from here to here (indicating on model)?
591
A. Scaling from the point where the stope ends in 501 drift, as shown upon this model——
Q. That is it.
A. That will have to be done rather roughly on the model.
Q. Well, do not minimize or unduly exaggerate.
A. About 550 feet. That is measured horizontally.
Q. And throughout that distance the——
A. And easterly over in the Tonopah Mining Company at the end of the stope.
Q. There, we have the course of the stopes at that level traversing the country easterly and westerly?
A. That is true, yes sir.
Q. Now, come to the west end of the stoping, as shown upon Defendant's exhibit A, I call your attention to the westerly terminus of the stope, as here shown, just about raise 582, to the easterly termination of the stoping, that is we come to the first break in the stoping in which is found the bottom of workings marked 570; what is the course of the stope there, easterly and westerly?
A. North easterly.
Q. About how far from easterly and westerly? What are the two courses?
A. About north 65 east. That is the general way. It is a local strike.
Q. That may be. I will take you now to the stoping that is

found without interruption, as represented on Defendant's exhibit A from its westerly terminus just beyond—what is that figure, 308?

592 A. 309.

Q. 309?

A. Yes.

Q. Give me the distance from that westerly stoping there shown in red to where we come to the first easterly break in continuous stoping, first easterly interruption? What is that distance?

A. About 480 feet.

Q. And what is the course of that stoping from end to end, average course?

A. At the westerly end—well, the average would be a little more to the north east than the stoping below.

Q. Practically the same? Substantially the same?

A. At the westerly end of it it is just about due north east.

Q. And you follow there in that section of the country from the top of what we claim to be the south dipping vein to the bottom of the stoping shown up or down the fissure in and along which the ore and mineralization is found to occur?

A. That is a continuous, uninterrupted vein from the point where the red meets the yellow.

Q. That is not my question, whether it is a vein or not. My question is, if you do not follow there without interruption, excepting due to the faults, where the ore passed—follow the fissure—if you do not follow through that section of the country continuously from the top to the bottom, or from the bottom to the top a fissure in and along which the ore and other mineralization is found?

A. You do.

Q. I will take you now to what we call the north dipping

593 vein as shown upon Defendant's Exhibit A, and ask you to give me the distance from the most westerly stopeing shown on Defendant's exhibit to the most easterly stopeing, and ask you to give us that distance?

594 A. About eleven hundred feet, measured in an east and west direction, not measured along the stope.

Q. And for that distance you are unquestionably in the same ore deposit?

A. Undoubtedly.

Q. And you can follow along the stopings that I have just called your attention to, and what we call the north dipping vein, do you not have a fissure from top to bottom except where it has been interrupted, by local faulting along which the ore and mineralization is found?

A. That is true, yes sir.

Q. I call your attention to what I will call an annex to the model, Defendant's Exhibit-A, to a stope in which is found the letters "T. Co."—meaning for the Tonopah Company,—that red stope; in your judgment is that a portion of the same vein, or the same ore deposits that we find at the easterly terminus of the next ore body in red, west of "T. Co."?

A. I am not sure.

Q. Have you any opinion about it? Can you correlate it?

A. I am not sure whether it is that ore body or a segment of the fraction vein. There is a fault already described intervening between the West End stope and the Tonopah Mining stope itself, and this stope which is shown on the extension to the model is still further to the east.

Q. So, if I understand you, so far as your observation or opinion goes, it may be or may not be a part of what we call the main south dipping vein?

A. That is true.

Q. Assuming that it is a part of the main south dipping vein, then give us the distance from the easterly terminus of the stope "T. Co." to the westerly first interruption in the stopeing?

A. Drift 501?

595 Q. Drift 501.

A. About 775 feet.

Q. And the course of that from end to end is practically east and west?

A. Well, that is on the assumption that that is the same vein.

Q. Well, of course.

A. You could hardly speak of the course of it; I should say that where it passes the fault there is a considerable displacement.

Q. What is the course of the stope shown on defendant's model Exhibit-A, in which the figures 555 are found, from its easterly to its westerly terminus?

A. That is just about due northeast the direction in the horizontal plane.

Q. Northeast or southwest?

A. Northeast and southwest, like that.

Q. What is the course of it measured from the easterly to the extreme westerly terminus of it?

A. That would be its strike.

Q. What is the course between those points?

A. Well you can take them in an east and west direction between the two points mentioned down the slope of the stopes.

Q. In other words measured in that way, it has about the same direction as all of the stopeing shown in red to the east thereof, has it not?

A. Yes, and the other directions have been given as the strike locally of the vein.

Q. What is the course—I will take it that way if you prefer or the strike of the stope, west of the West End shaft where you find the figures 403?

A. Oh about north 70 east.

Q. Between what points do you select there as determining

596 the *the* course?

A. Take the stope itself and lay a horizontal line up in it, as I am now indicating with the pointer, more northeasterly than I stated.

Q. What is the true local dip of the vein where that ore body is found?

A. Where that particular stope——

Q. Where that ore body is found, what is the true local dip of what we call the main south dipping vein?

A. The dip is steepest down that vein almost due southeast.

Q. I understand that it is now your opinion that there is not found anywhere in the West End claim, the top or apex of any vein, unless it be what was sometime in the misty past, in your opinion the outcropping area, where that ore encounters the Fraction dacite breccia?

A. In my opinion that is the only termination of the vein along the line of that buried outcrop.

Q. When did you first make an examination of the underground workings, or any of them, in this ground in controversy, with a view of acquainting yourself or preparing yourself to testify in the case as an expert?

A. I arrived here the morning of April 28th, this year.

Q. How long were you engaged in your examination at that period?

A. Twenty six days, pretty nearly a month.

Q. How long?

A. Twenty six days.

Q. When was your next visit?

A. Arrived here the 25th. of August.

Q. How long were engaged then?

A. Until the 5th. of September.

Q. When, Mr. Finch, did it first occur to you that this westerly edge which you speak of now, as being the top or apex if this vein has any top or apex,—was or might be its apex—when?

597 A. When I first saw the profound disintergration and staining and oxidation of it at the 600 level?

Q. When was that?

A. I don't believe that I could fix that date.

Q. Was it during your first visit?

A. The first time that I ever went into that level as I recall. The first time I ever saw that end of the level as I recall.

Q. Was that during your first visit that it occurred to you that this terminal edge was, or might be the top or apex of this vein?

A. I am not sure that it was the first visit.

Q. Well, what is your best recollection about it?

A. Well, I am sure that that matter became clear on my second visit.

Q. Well, you were out through that westerly terminal edge on your first visit, those twenty six days that you were here?

A. No.

Q. You did not go out there at all?

A. Not that I recall. On my next visit I didn't.

Q. You are sure that you did not?

A. No, I am not sure that I did not. There is great area to cover here and there has been a great deal of detail of taking of notes, and

I could not recall the dates in any particular working.

Q. I am not asking for the particular date, I don't suppose that you could give that unless you made a special memorandum of it. Are you unable to teil us when it occurred, I do not mean the date, but on which of your visits that you made you- examination by which you determined that this westerly edge was the top or apex of the vein?

A. I think that it was in the August visit.

Q. Did you first suggest that, or did some of your co-
598 laborers co-investigators, *made* the suggestion? You or Professor Lawson or Mr. Searls or Mr. Siebert.

A. I think that we were more or less simultaneous in arriving at it.

Q. Some one must have observed it first?

A. I think I did observe it first, but it was at a time when we were working together on the same level.

Q. Then am I to understand or is the court to understand that you were the first one to suggest that the course or strike of this vein was northerly and southerly across the sidelines of the West End claim, and that its apex is found at its westerly terminal edge where you come in contact with the Fraction dacite breccia?

A. No I would not say that I made the suggestion that the course or strike of the vein——

Q. What is it?

A. I would not say that I first made the suggestion that the course or strike of this vein was in a northeriy or southerly direction, because taking the vein as a whole I believe that opinion has existed in Tonopah for a long time.

Mr. Dickson: I will ask that that be stricken out. The opinion of the witness is all that I want, not the opinion of Tonopah.

A. Well, I said that I would not take the credit for originating that idea.

Q. Who made, if you know, who first suggested that this westerly terminal edge was or might be the top or apex of the vein?

A. I think I did make the suggestion, or show the condition of a buried outcrop, first.

Q. Were you the first to make that suggestion that that
599 might be taken to be the top or apex of the vein?

A. I possibly made the first observation.

Q. Possibly. Is that your best recollection?

A. Yes, certainly.

Mr. Lindley: I submit that the witness ought to be permitted to finish his answer before counsel interrupts.

Mr. Dickson: I thought that he had answered. Just read the question and take his answer.

Mr. Peck: The motion of Judge Dickson to strike out, I don't know whether it was ruled upon, and Judge Dickson probably did not hear.

The Court: It was not ruled upon, because I did not think he was

insisting upon any ruling to the explanation Mr. Finch made. It can be ruled upon. Do you want it ruled upon.

Mr. Dickson: If I was trying the case before a jury, yes, but before the court, no. I think that the court will discriminate between his opinion and the general opinion.

The Court: The opinion in Tonopah generally will be disregarded.

(Question and answer read.)

A. It is my best recollection that I made the first observation that that was a buried outcrop; that is among the engineers connected with the case.

Q. Do you remember to whom you made the suggestion, first?

A. Mr. Siebert and Mr. Searls, I think.

Q. So far as you are able to recall nobody had suggested that to you, before you had observed it and suggested it?

A. No, I think not.

Q. Now, can you in the light of that fact, can you recall whether or no it was during your first examination of some considerable—covering a very considerable period, that you made that observation?

600

A. No, I think that it is the second period, but I wish it to be understood that that is not a difficult thing to observe; it is merely something that was not arrived at, because we were mapping the vein in its position, and had not up to that time particularly studied its characteristics.

Q. Was not one of your purposes on that visit, and all others, to ascertain to your own satisfaction where the top or apex of this vein was?

A. During my entire first visit my time was occupied entirely with the detailed routine of mapping the position of the vein, without forming any conclusion as to its end or apex, or anything else.

Q. When did you first begin to investigate with a view to determining, if you could, where the top or apex of this vein was, if it had any?

A. After we got the map together showing where the vein existed in the ground.

Q. I cannot hear you.

A. After the notes were all correlated and put together, then the effort was made to begin to form conclusion.

Q. That is as definite an answer as you can give to the question I suppose?

A. It is true that on my visit, my first visit, I did not feel that I had given the thing enough searching scrutiny to form reliable conclusions. I did have more of a feeling that the conclusions were reliable in the August visit.

Q. Is it your opinion now that what you call the westerly terminal edge the top or apex of the vein?

A. Undoubtedly.

Q. And that is based upon the fact that you found the vein as you go westerly terminating against this Fraction dacite breccia, and found the oxidation?

601

A. Yes, and the other things which I have mentioned.

Q. What else?

A. The disintegration of it, the disintegration of the vein at that point, and the fragments of it in the form of float lying below the buried outcrop.

Q. If you found float there what does that tend to establish except that that surface had been exposed once?

A That is just what it tends to establish.

Q. Nothing else. What do you mean by disintegration along that line?

A. It showed a cracking and breaking up of the quartz and filling with material working down from the surface through the soil, as is the case in the outcrop of veins at the surface everywhere.

Q. You would expect that if that was an exposed surface and the vein was at the time on the surface and exposed—you would find some oxidation and breaking up and disintegration of the outcrops of the vein? That is what you mean by that?

A. Yes, certainly.

Q. Suppose there had been an eruption, volcanic or other eruptive rock, in the region which you now call the westerly terminal. That would have the effect of disintegration and breaking it up?

A. It would break it up, but if it was an explosion working upward, it would not leave the fragments below the outcrop, and it would only have the effect of cracking up the edge of the vein, and not have the effect of oxidizing it.

Q. Take one question at a time. If there had been an intrusion there from a very considerable area of eruptive rock, it would
602 have the effect naturally of disintegrating and breaking up the vein along the cut-off edge. We will come to the oxidation afterwards.

A. It would shatter it. If the volcano itself were conceivable that would be the cause. It would be shattered, the vein, where it crossed it.

Q. Now, coming to Plaintiff's model exhibit-2, point out to the court the various places where you find the ore of the vein terminating against the Fraction dacite breccia?

A. At all the points.

Q. Take but one at a time and point them out?

A. In winze 664 below the 600 level, in the extreme westerly end of the 600 level; at the extreme westerly end of the 500 level, where in each instance the vein stops at the Fraction breccia, which overlies the outcrop. In the 300 level where the vein is actually stoped up to its outcrop; and in the cross cut below the stope, stope marked 4; in the 172 level of the Porcupine shaft, where a raise upon the vein goes to its outcrop.

603 Q. There you find the breccia above the vein?

A. Yes, as in all cases. And in raise 166, where a raise also upon the vein shown in red, the raise cuts up along the vein, penetrating the breccia the same vein as stoped in this MacNamara region that shows a very good exposure of the outcrop and of the float connected with it.

Q. There, the outcrop or cap rock lies above the vein at those two places?

A. Oh, yes.

Q. Here it lies on its westerly terminal edge?

A. It lies above the edge of the vein in all places.

Q. The edge of the vein but-s up against it, does it not?

A. Yes, at this point.

Q. Where is that?

A. Stope 4, on the West End 300 level.

Q. And this next place?

A. That is the extreme west end of the 500 level.

Q. And the next place?

A. Extreme west end of 600.

Q. And the next place as found as you follow the ore downward, you encounter this same fraction dacite breccia?

A. That is a slightly different case. It is not the end of the vein, it is the hanging wall of the vein which was exposed to the surface, and the vein still projected on westward beyond that winze. There is another case of the same kind along the stope between the 300 and the 200, and the 300 and the 400.

Q. Number it.

A. Marked, and shown by the yellow shown upon the edge of the slope. That is a mere case where the overlying rocks have
604 been washed away in a gulch, and the breccia overlaid the vein or hanging wall of it, not the end of it.

The Court:

(Q.) Did you speak of this point (indicating)?

A. The vein shows up into the breccia here and that extends out into the overlying foot wall rock. Another point where the rock meets the breccia, not the vein.

Mr. Dickson:

(Q.) So that you have to-day in the ground many places where you find what you call this fraction dacite breccia encountered, as you go upward through the hanging wall of the vein?

A. Yes.

Q. And in this working, 650 A?

A. No, there are only three places where the hanging wall is exposed, as distinguished from the terminal edge of the vein.

Q. Well, in three places, then, and a very considerable distance easterly of what you call the outcrop of the vein you find this fraction dacite breccia overlying the hanging wall of your vein?

A. We do. Not very considerable distance.

Q. Well, several hundred feet, according to the model?

A. No, about 200 feet. And it is in a gulch which is shown.

Q. Isn't here a place? (Indicating?)

A. Yes, that is up toward the head of the gulch on the hillside. Here is another point on the gulch.

Q. What is this point I am now pointing to? How do you designate that on the model?

A. That is raise 250, it is called.
Q. On the map exhibit 1?
A. Yes.
Q. How far is that easterly of the westerly terminal edge
605 of your vein?
A. That is about 300 feet.
Q. And then in another place——
A. That is because the gulch ran at an angle way up the hillside.
Q. Nevertheless, the dacite breccia lies above the hanging wall at the vein there?
A. That is true.
Q. And then, as you go down winze 664, as you follow down that winze in ore, you come through from a downward course in contact with this same dacite breccia?
A. Yes.
Q. Then, there are three places that you have pointed to heretofore where the——
A. 5 on this side, and a number on the MacNamara side.
Q. Well, where at the westerly terminus it comes up against the dacite breccia, it has flowed out and covered it up at some period after it was an exposed and eroded surface along that terminal edge?
A. That is true, yes.
Q. What?
A. That is correct. I would like to explain that in one of these places in the upper level of the MacNamara, the outcrop is complicated by a little local fault displacement, but the fraction breccia is shown there, nevertheless, in the oxidized materials mixed up both with the contact and the fault plane.
Q. How long, speaking in time as measured by geologists, in your judgment was that which we call the outcrop or terminal edge of this vein exposed at the surface before the flow or eruption, whichever it was, of the fraction dacite breccia? Thousands of years?
606 A. Oh, yes; many thousands of years.
Q. Many thousands of years that was an exposed surface?
A. Yes; being worn away all the time, of course.
Q. What?
A. Being worn down all the time by erosion.
Q. Yes.
A. The outcrop of the vein working further down the dip toward the east.
Q. And how long has it been since the outpouring flow or eruption of the fraction dacite breccia took place? Many, many thousands of years, in your judgment, I take it?
A. How long did you say?
Q. Yes.
A. Oh, I would not undertake to estimate that.
Q. But even speaking of time as you speak of it, as a geologist, a very long time?

A. It was long enough to change the topography, which had a general slope towards the south on the Midway andesite surface, to another slope in a totally different direction.

Q. Well, ages of time?

A. Not as a geologist uses the word age, that is about the longest geological term.

Q. I do not use it as a geologist does.

A. In a human sense, ages, yes.

Q. Probably since before the commencement of recorded history?

A. Very likely.

Q. Throughout those thousands of years that must have intervened or elapsed since the Fraction dacite breccia was erupted or poured out over that country, of course, I take it neither you nor any other geologist could tell what changes have undergone in
607 that Fraction dacite breccia? It might have been, in ages past, after its outflow much more open and broken, giving access to the air and to the surface waters than would be observable to-day?

A. If that had been the case, I think we would see the marks of it in the mine, but we do not.

Q. Is it your opinion that from the time that Fraction dacite breccia was deposited through all those thousands of years since then, that there has never been an opportunity for the surface waters and the air to come down through that material and encounter what you call the outcrop edge or terminal edge of this vein?

A. I will tell you, if you care to have me, what I find in the mine bearing upon that subject. In the 300 level, cross cut running from the end of the vein in a curved direction around into the Ohio, there is a great deal of this rock. It is loose, to a certain extent, but I can not find in this level any of the evidences that a water body existed in the rock.

Q. No, I do not mean a channel.

A. No, I mean the rock was not saturated with water, and it has not been a free avenue of circulation. The rock seemed to have compacted itself into a pasty matter which is not permeable.

But that does not convince me so much that oxidation could not be effected upon this vein, as the fact that the most marked and intense alteration which is shown is at the depth of 600 feet in the mine, and that the depth of oxidation from present day processes I have not found to extend any great distance at all below the surface.

Q. Suppose ten thousand years ago, after the outflow or
608 eruption of the Fraction dacite breccia, it, that rock, that breccia had been saturated with water—I do not mean defined streams of water running through it, but percolating water in it coming down from the surface, breaking down through the rock in that form; not a form of defined channels, do you mean to say that the evidence of that condition could not have been obliterated in all the ten thousand years following, so that it would now be impossible for you to discover it?

A. Yes, I mean to say precisely that. Because water standing in the rocks is not an active means of alteration, and water in all the

mining districts of the west practically does stand in the rocks in the presence of sulphide ores and does not oxidize it beyond a certain depth.

Q. I did not mean stagnant water; I meant water percolating downward from the surface through that breccia; couldn't it have occurred ten thousand years ago, and be no trace of it left now?

A. Well, I don't think it could be a rational conception.

Q. You do not?

A. Not that water percolating through this entire area should have left its marks of oxidation along the slender line at the edge of that vein under present day influences.

609 Q. Well, the entire area, so far as you have it oxidized along the terminal edge of this vein in feet is very small? How many feet have you in exposure here at this—what do you call this point?

A. That is the west end of the 600-level.

Q. How many feet of exposure do you have there of oxidized rock?

A. Quite a number. I will tell you more exactly from my notes. It is exposed in two points there not far away from each other.

Q. How many feet each of oxidized rock?

A. Oh, the rock is thoroughly oxidized for a distance of 150 feet along the level.

Q. At this place?

A. Yes.

Q. What is the scale of this model?

A. Forty.

Q. Well, it is not more than — inch, as shown here.

A. You asked for the oxidized material. It extends back from the outcrop into the vein.

Q. Oh, it does. Above the vein?

A. No, in the vein itself. The oxidation is of the vein and of the outcrop and down from the outcrop for a certain limited distance, and it extends back for something like 150 feet eastward; however, the vein on a strike, that does not mean that it extends very far downward from the outcrop.

Q. How far upward do you go there before you get to the outcrop?

A. A hundred feet from the westerly terminus,——

610 Q. Of that level?

A. You have the actual outcrop in the end of the level.

Q. I know. How many feet have you there exposed of actual outcrop where you find the oxidation?

A. About 40 feet, all told, I should say.

Q. And then going to the 300-West End, the terminus of that——

A. Five hundred.

Q. Five hundred, is it? At the westerly terminus of that how much of an exposure of the terminal edge have you of the oxidized ore?

A. About the width of the drift shown there, as is natural when the drift follows the vein to the outcrop.

Q. Now, at the westerly terminus of stope 4, shown on this model:

to what extent have you an exposure there of the terminal edge showing oxidation?

A. Down along the,——

Q. (Int.) Right on the terminal edge.

A. Probably 30 feet, or more.

Q. And where next, as we go northerly, do you find the vein terminating against the dacite breccia and the rocks in contact therewith oxidized?

A. At the terminal edge? The next point in the 172-level.

Q. How much of an exposure there?

A. Without looking it up definitely, I should say 8 or 10 feet.

Q. More than is shown on the model here?

A. Well, it goes up slightly diagonal. It cannot be shown very accurately in detail on the model.

Q. Where next?

A. And then in the 166-level, quite an exposure of it there.

Q. That is above, in the hanging-wall country?

611 A. I should say there would be 15 feet exposed there.

Q. That is in the hanging-wall country?

A. No, that is the outcrop of the vein.

Q. You say it is the outcrop of the vein?

A. Yes. Lays right in the dacite at the workings in that level.

Q. Is the vein exposed throughout that level?

A. No.

Q. How far is it exposed?

A. About, I should say, 15 feet.

Q. Calling your attention to this point, you gave me the number of that once before and I have forgotten.

A. It is marked on the model 250-raise.

Q. 250-raise. There the dacite breccia lies in the hanging-wall country?

A. Yes, lies right on the hanging-wall of the vein.

Q. Is that oxidized too?

A. Oh, yes.

Q. And how far,—you told me it was over 300 feet from the terminal edge.

A. That was the point.

Q. Where have you found in this mine,—what depth have you found the greatest amount of oxidation, the most extensive and most intense?

A. On this particular vein, as I stated, it is at the buried outcrop on the 600-level, and extending back into the vein.

Q. Do you find the most extensive and most intense oxidation; where, in the mine, what is the greatest depth in the mine, apart from this terminal edge, so-called, where you find the most extensive and most intense oxidation?

Mr. Lindley: Away from the terminal edge.

612 Mr. Dickson: Yes, away from the terminal edge.

A. Well, that is the deepest point.

Mr. Lindley:

Q. Well, he means oxidation in the mine at some other place.

Mr. Dickson:

Q. Apart from this deepest point.

A. Well, there are a number of other points where there is oxidation.

Q. How deep down?

A. Under this Midway andisite cap rock.

Q. How deep is that where you have the oxidation?

A. 400 feet; on the east end of the 400-level there is considerable oxidation.

Q. Point out on the model about where it is.

A. It is around this whole hanging-wall stringer region in the east end of the four hundred; the Midway andesite, buried surface under the Midway andesite existing there.

Q. And down in the mine where the ore bodies are found, do you find oxidation apart from along this terminal edge?

A. I do not recollect any noticeable oxidation, except near what was at one time the surface of the earth.

Q. Were you pursuing your investigation with that particular question or fact in mind, namely, as to where you found down in the workings of the mine, way beneath the cap rock, oxidation?

Mr. Lindley: I did not understand the witness to say that he found it way beneath the mine under the cap rock.

Mr. Dickson: I did not say he did. I asked him if he had it in mind when hunting——

A. I do not have any conspicuous places in mind.

613 Q. Have you any, without being able to locate the point? Have you, apart from this terminal edge—I will keep away from that now,—have you in mind any place where you found quite extensive oxidation down in the mine below the cap rock?

A. No, I do not recollect any places, except workings up to the bottom of the Midway andesite, or the Fraction breccia.

Q. I repeat the question I put to you before,—did you, as you went through the mine, have in mind that particular thing,—where, under what circumstances, and how extensive you found oxidation, apart from this terminal edge.

A. Yes, I tried to keep that in mind, yet there are many places in the mine where other things were of such interest that I might have overlooked some little patch of oxidation.

Q. I do not mean little patch; I mean extensive oxidation.

A. I might have overlooked a considerable patch of it where it would have no particular significance.

Q. If you were to break rock—take your specimen, what is the marking on that, Mr. Finch?

A. Intended to be "Finch 8."

Q. And this one is?

A. "Finch 9."

Q. Where rock, broken rock especially, is exposed at the surface, and where you have changing conditions in the atmosphere, changing conditions of moisture and dryness from time to time, week to week, the work of oxidation will set in very rapidly, will it not? In a very short time?

A. Depends upon the material.

Q. Well, material such as these two specimens, 8 and 9?

614 A. They are very slow to oxidize because,—that is, to show the visible effects of oxidation. This staining comes from metallic minerals mostly iron, and there is very little iron in the quartz.

Q. Iron oxidizes readily when exposed to the air and changes in the moisture?

A. What I mean to say is, that if there is a considerable amount of iron stain it may develop more rapidly, but where there is so little iron it will develop very slowly.

Q. Is might not appear to be so intense, but if there was iron, at all, exposed at the surface, it would readily oxidize wouldn't it?

A. Oh, yes.

Q. And show the stain the color?

A. Yes.

Q. For instance, if you were to break rock in a mine this month, throw it out on the dump, if it contained any iron, even a little iron, and leave it there until next autumn wouldn't you expect to find the evidences of oxidation on the broken rock on the surface of the dump?

A. With some ores, that is true.

Q. Rock carrying iron in any appreciable quantity?

A. Yes, any considerable quantity that may be true.

Q. And even a little quantity, whatever it was, if it were on the surface of the rock, it would be readily oxidized wouldn't it?

A. Yes, if it was exposed to the air. But it would not be the oxidizing effect shown in these specimens.

Q. Well, I do not know anything about that.

A. There is additional material besides the oxidation.

615 Q. The oxidation here on this sample 8 shows where there has been evidently a crack in the rock, fracture?

A. Yes.

Q. The oxidation does not appear to have extended here to any great depth, on either surface?

A. No. But it is accompanied by the deposition of other minerals along with that stain, superficial deposition of minerals along the outcrop of the vein. These minerals are deposited by a very slow process, such as this crestification of silica and other minerals.

Q. How long would it take do you know?

A. Oh, I don't know; a long time.

Q. If you were to take a steel blade and throw it out on the lawn, where the dews were falling and the next day the sun shown in forty-eight hours you would have evidence of oxidation, of the steel itself wouldn't you?

A. Yes, but we do not have any native steel in the veins.

Q. Well, is steel more rapidly oxidized than the iron that is in the ore?

A. Oh, yes.

Q. Noticeably so?

A. Oh, yes.

Q. The iron itself, I understand you to admit, when exposed to the air and to the rains and the sunshine, will show evidences of oxidation in a very short time?

A. Yes. Oh, in not a very short time.

Q. Well, in a few months, as compared with a few hundred thousand years?

A. Well, in a few years, as compared with a hundred thousand, it did not take a hundred thousand years, now understand, to produce the stain in this outcrop. The stain is produced as the erosion goes along, and a certain stained outcrop is in time removed,
616 and stained outcrop takes it- place. It is not a long period of oxidation.

Q. Was the oxidation on this exposed surface, as you believe it to have been at one time, where this terminal edge is found, more rapid than the erosion?

A. Somewhat. In certain cases they may keep in step so that very little oxidation is left; the erosion keeps right up with the process of oxidation. In other cases the oxidation may work much more rapidly and the erosion be way behind it, so that the oxidation is deep in a vein.

Q. What is the nature and structure of the material that you call Fraction dacite breccia agaunst which this vein in its westerly course abuts or terminates?

A. It is a fragmental rock.

Q. What?

A. It is a fragmental rock.

Q. Broken rock do you mean?

A. Broken in the sense that it came in the form of fragments and praticles from a volcanic vent, and settled upon the earth in part. Other layers,—it is somewhat roughly bedded, other layers appear to have been somewhat in the nature of a mud flow at the time of the volcano, so it varies from a rather fine material into a rather coarse material and it includes fragments of the older rocks which aside from the position of the Fraction breccia indicate its age with reference to the included rocks.

Q. Do you know whether this Fraction dacite breccia, when it was first penetrated by the mine workings, at the westerly terminus, or elsewhere, whether it was dry, hard, rock or soft and full of water?

A. I do not know much about that.

Q. Do you say—you do not know anything about it?

617 A. No, I do not think that it would make any difference to my conclusions if I did know.

Q. About this Siebert Fault, that I understand you was post mineral? It had nothing whatever to do with the deposition of any of the ores or mineralization that we now find in its vicinity?

A. Nothing to do with them except to clip off some of the stringers that extended up into the hanging wall.

Q. Where if at all did it fault?—Another question: Have you been able to determine the maximum extent of the displacement anywhere along that Siebert fault?

A. No, not with any degree of accuracy; because the developments are all more generally in a north and south direction.

Q. Have you been able to determine that it was more than a given amount?

A. Oh, yes.

Q. More than a few feet?

A. Yes.

Q. How great a displacement have you been able to determine that it must at least have equalled?

A. Certainly more than a hundred feet, probably a good deal more than that.

Q. Is that always in a horizontal direction measured easterly and westerly or was there another component and downward dislocation?

A. Well, measured along the fault, it is; probably two or three hundred feet or more.

Q. How is that?

A. Measured along the fault it is in the direction of its movement probably two or three hundred feet.

Q. In an easterly and westerly direction?

618 A. That is in *an* northeasterly direction.

Q. Well, does either side of the country through which that fault cuts drop?

A. Yes, the hanging wall is slid down to a lower elevation in the trough of the fault.

Q. Does it slide directly down, or partially down and partially easterly?

A. Well, it slides directly down but the amount of the sliding down measured north and south is not so great as the amount if measured northeast and southwest.

Q. It has dislocated the country in two directions, easterly and westerly and downward?

A. Oh, no.

Q. Has it dislocated the country at all on either side of the fault?

A. Yes, very materially.

Q. In more than one direction has it dislocated the country?

A. We are working under a confusion of terms.

Q. Well, straighten me out.

A. I will take a sheet from my note book and show a mass of over riding rock, starts up at this summit and moves in a northeasterly direction a very considerable amount. It will be observed that it is possible for the dislocation from its original position here, measured in a north and south direction to be very small, whereas its displacement in an east and west direction would be very large, and yet, it is the same mass of rock that has been moved.

619 Q. Well, did the hanging wall of that fault,—the hang-

ing-wall country move down as well as easterly relatively to the foot-wall side of the fault?

A. It moved northerly and easterly.

Q. Did it dislocate what we call the north dipping vein?

A. No.

Q. At no place?

A. No; merely rubbed the top of the massive quartz in it and took away a zone of stringers.

Q. And had nothing to do with the deposition of minerals and it has nowhere dislocated and displaced the vein itself?

A. No; it had nothing to do with the deposition of minerals because we find in the cracks of the vein or fault, the minerals ground down into the vein itself.

Q. It is merely post-mineral.

A. Yes.

Q. What figure, or what part, did this Siebert fault have to do in determining what the strike, or course, or dip or top of this vein is?

A. It has not materially affected the form of the vein at all.

Q. I repeat the question. What part, if any, did this Siebert fault play, in your determination of what the strike or course or top or dip of this vein is?

A. To my mind it had no affect at all except upon one particular thing. My view of the vein is that the outer boundary of it should, geologically, include the zone of stringers; there is a solid band of stringers which is more the miner's vein than the geologist's vein. The miner's vein, the solid part of it, is intact and unaffected
620 by the Siebert fault except at some places where they are in contact there is a little crushing.

Q. But no deposition?

A. No deposition. The hanging-wall fringe of stringers has been at certain parts locally removed from the solid part of the vein.

Q. By the Siebert fault?

A. Yes.

Mr. Dickson: If your Honor please, I was in hopes I could get through with the cross-examination this morning, but I do not feel like going on; I have neuralgia very badly and do not feel like working, and I understood from some of the gentlemen connected with the case that your Honor had to go to Goldfield and would be agreeable to going to Goldfield to-lay instead of tomorrow.

The Court: Well, I cannot do that, Judge Dickson, because the two cases are set there for tomorrow, but if you are not feeling well I will shorten the sessions.

Mr. Dickson: Well, I will try to go on a while this afternoon.

The Court: Well, why not take a rest until this afternoon?

Mr. Dickson: Very well.

The Court: This case, then, is continued until 2 o'clock this afternoon; Court will remain in session until 12 o'clock for whatever may come before it.

621 14.

December 15th, 1914—two o'clock p. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

JOHN W. FINCH on the stand for further cross-examination.

Mr. Dickson:

Q. As I understand on these sections on the glass model, exhibit 3, on your direct examination you included the Siebert fault, where it is sketched in in broken lines, is a projection based upon observation made elsewhere?

A. That is the intention, yes?

Q. Point out on section one as you go down raise 488 where you have ceased to depict the Siebert fault, an unbroken line and where you have commenced to depict it as a broken line; how near the bottom of raise 488, you have changed the solid line to a broken line?

A. Well, it should be changed immediately below, and it is. There seems to be some dotting along the raise itself which should not be done because it is absolutely developed there.

Q. It should be a full unbroken line as far as the raise follows the fault?

A. Yes. It is shown clearly on the paper section from which that was reproduced.

Q. And on that section there from the top of the 488 raise upward, and from the bottom of it downward, the Sievert Fault should be depicted in unbroken lines?

A. Yes.

Q. You have nothing above the top of the 488 Raise, nor below it in that section,—nothing but a broken line showing the fault?

622 A. No, because it projected for a certain distance downward into the Tonopah Mining Company's level in that section.

Q. Practically depicted as a broken line from top to bottom on this section except where the 488 raise follows it?

A. That is true. And for the reason that that is the only working on this section where it is developed; at a short distance away from the section,——

Q. Take section 2 in Exhibit 3. Where, if at all, have you the fault developed by any line of works apart from which the fault in its upward and downward course is depicted as a broken line?

A. At points where it is developed in the West End workings, and in drifts and raises and cross cuts for a considerable distance at and above the four hundred level, and downward in 573 raise,—it is shown as a solid line.

Q. What is your distance there approximately?

A. Oh, about 150 feet.

Q. Apart from that the fault on that section is represented in broken lines?

A. No, except where it is developed in this plane of section, except its position is determined. Developed in 400 level of the Jim Butler.

Q. Developed back in the raise?

A. Yes, sir.

Q. The width of the raise?

A. So that it becomes the position of the fault.

Q. For the dimensions of that raise only, you mean?

A. No, I mean the position of the fault for that cross section, because there is no other feature similar to this fault in the cross section.

Q. Well, there is no other place where you have it actually developed in the plane of that section?

A. Oh, yes.

623 Q. Going to the number three sheet, where have you it actually developed in that?

A. We have it developed near section three in the cross cut of the Tonopah Mining Company, at the extreme east end of the section; near enough so that it might just as well be represented as a solid line there, whether it is or not, I cannot see. Then in the four hundred workings of the West End, above the four hundred level along the top of the stope, and then developed for some distance along the top of the stopes.

Q. Right there along the top of the stopes it is not actually developed except at intervals?

A. Well, very close intervals.

Q. Maybe I can save time. At least wherever the fault on anyone of those sections is represented as a broken line, it has been projected, and is therefore not put in in solid?

A. That is the principle of representation?

Q. And taking each section by itself the workings are depicted thereon, which would cut the fault?

A. Yes.

Q. And under the fault any piece of work is extended in connection with the fault?

A. Well, that is not strictly true; it has some correlation in the section with workings immediately at hand, and shown better upon the plan map in Exhibit-2.

Q. You have shown upon each of these sheets every piece of working actually cut by the plane of section?

A. That is true.

Q. And each section would show the distance where the fault was followed or cut by any line of working?

624 A. Yes, there are some places where the solid line and such positions as in section-5,—for instance where four points near at hand—so near at hand that anybody who looks at it with any care, could not be mistaken in it as the same fault,—where a solid line has been drawn through those four points; it is not a continuous development but amounts to the same thing.

625 Q. It would show the extent where it was a continuous development and where it was conjectural, it had been projected?

A. Yes.

Q. Do I understand that in the raises 488, 2 A, 4 A, 5 A, 6 A and 7 A that those raises are put up on this Siebert fault?

A. They are.

Q. Just step to Defendant's model, Exhibit A, where we have the distinctive colors of the two veins for a moment. At the bottom of 488 raise, starts at a small stope, does it not?

A. It is not exactly a stope, no.

Q. It is larger than a drift, that is why I supposed there was some ore taken out there?

A. I think not. It is mostly gouge matter of the fault. It is the top of the raise, it is not a stope.

Q. It is beneath the bottom of the raise?

A. Yes.

Q. Hasn't that been stoped out?

A. I think not. Just merely a raise, a continuation of the raise that breaks over and crosses the level.

Q. It is very much larger than 488?

A. Yes, paved down there, apparently.

Q. Isn't there any ore in that?

A. I think are seams of ore in that; it looks like it.

Q. A part of the MacNamara north dipping vein, or that portion of the MacNamara vein that takes northerly, the way that is there, beneath the bottom of 488?

A. Extending over and running up from the main vein.

Q. It is a part of the MacNamara north dipping vein?

626 A. In that sense, yes. I can answer that question best and most explicitly by the drawing which was made on the ground.

Mr. Lindley: Just mark it, "Finch X 1."

The Witness: The main body of quartz lies at a very considerable distance below the point which you mentioned, which is here. There are seams of quartz which I have represented in red, and they might assay considerably for all I know. But there are upward extensions of the stringer zone.

Q. We will come to that maybe later on. Designate this line of work in some way.

A. Well, that whole system of work has been called the 569 raise, the original 569 raise running up and connected with the level.

Q. This is not a raise where you have 569?

A. Well, they call it a raise.

Q. It runs apparently very near horizontal?

A. It is just along the summit.

Q. Isn't that a cross cut between the north dipping and south dipping flanks or side of your anticline?

A. It is not. It is a working which follows in an arched form on the principal ore streak of the anticlinal vein.

—. How deep is the quartz there below the plane of juncture between the two veins? How many feet?

A. It is right at the juncture.

Q. And how far below it does it extend?

A. That has not been developed, I do not know. It extends certainly a number of feet because it is shown in 537 raise to extend somewhat in the way of seams below that solid body of quartz.

627 Q. Have you no idea, Mr. Finch, how far above this line of work beneath which you have placed that mark—how far above that line quartz extends above in its upward course until you come to a junction of the two veins at the crest of the roll?

A. The working is itself along the continuation of the vein. It is not a junction.

Q. Let us see if I can get at it this way: haven't you quartz above that line of work?

A. Stringers of quartz.

Q. Haven't you quartz above that line of work clear up to the junction?

A. I don't know of any junction of any two veins in that section.

Q. Well, the crest, then of the fold, the bottom of the crest of the fold, the bottom of the two hanging walls at the point where you turn from the north dip to a south dip. You know what I mean? Haven't you crossed above this line of work marked here on this Finch X exhibit?

A. I know what I found in the ground. A solid body of quartz continuously between 537 raise and 569 raise, and above that body of quartz other stringers of quartz—no, change that; stringers of quartz extend up from the main body for a very considerable distance up into the 400 level, and above the 400 level into 488 raise, which I now mark, and up and against the Siebert fault.

Q. That is a long way from what I am speaking of. I am speaking of this cross cut.

A. Well, I do not understand the question.

Q. 569 was marked here "569"?

628 A. Yes, in westerly.

Q. Haven't you quartz in the floor of that?

A. Yes.

Q. From end to end?

A. Yes.

Q. Haven't you quartz in the roof of it from end to end?

A. Not solid quartz in the roof from end to end.

Q. Substantially?

A. There are stringers of quartz for part of the distance in the roof of that.

Q. If the quartz extended up to the hanging wall of the north dipping vein over this cross cut 569, you could have given that line of work under which you have placed the figures "569" even a more pronounced curve, couldn't you, depending upon the line of work?

A. This is just exactly the way the quartz lays in the ground and was mapped with great detail and great care.

Q. That is the way the work lies in the ground, isn't it?

A. The red lines are the way the quartz lies in the ground.

Q. As cut by that line of work?

A. Yes. The 569 in pencil indicates the working just driven upon the miner's part of the vein.

Q. And beneath that, in the floor of that from end to end you have quartz?

A. Oh, yes. More vein stringers show down 537 raise.

Q. Aren't there places where you have bodies of quartz between the north dipping and south dipping flanks or branches or sides of the anticlinal fold beneath the point of the junction of the two, where you turn from a south dip to a north dip? In other words, at the crest or beneath the crest, quartz in sufficient size that you
629 could run a line of work in the form of a complete circle and have quartz above and below every inch of the way along that?

Q. You could do that, but you can not follow any structure in doing so.

Q. The structure, or intervening country is not conformable, is it, beneath the arch or crest?

A. The structure of the quartz is conformable.

Q. You have there north and south fissures, have you not?

A. Cracks formed in the quartz, not structure of the quartz. There are cracks—permit me to explain to make myself clear—those cracks cut through the structure of the vein. The structure of the vein is marked by the streaks of ore in it better than anything else, and those streaks of ore are continuous over the ridge.

Q. Is the structure of the vein, then from the crest of the fold as you go northerly followed in its downward course at a regular dip to the north, vein material, quartz?

A. Oh, it is a waving, undulating form on both sides of the summit.

Q. But does it conform in its downward course, the structure of the vein material, quartz, to the course or direction upward of the north branch, the north side of the roll? Do you understand?

A. I don't believe I do, Judge.

Q. As you go down on Section A on the glass model, maybe you have better go farther to the west where you have more extensive developments in ore.

Mr. Lindley: Section A on the glass model?

Mr. Dickson: Section 1 is it?

630 Mr. Lindley: Yes.

Mr. Dickson: I withdraw that question and put 1 at the westerly end where you have larger bodies of ore developed on the north dipping vein, or the north side of what you call the fold. As you go down this most westerly stope from the crest of the roll at the west end, does the quartz, as you follow it down, have the structure, the position—I mean by that the direction that the hanging wall of the vein has?

A. Oh, yes, it has the direction which is shown by the stope work-

ing itself. And the structure of the vein is shown best by the very streak of ore which the miners excavated.

Q. That is true of what we call the south dipping vein also?

A. Yes. They are both exactly alike in that respect.

Q. And do you mean to say that throughout, beneath the arch of the crest where you have continuous quartz from the south dipping branch to the north dipping branch for a hundred or 200 feet in length, between the two, that the structure there of that quartz, that intervening quartz has on one side a north dip, and on the other side a south dip?

A. Oh, yes. Section——

Q. That will be one of the points that we want to invite attention to—the Court's attention.

A. Section No. 2 shows that pretty well, or any section.

Q. Well, is it generally true——

A. Yes, it is generally true.

631 Q. That the quartz lying between the north dipping side of your anticlinal fold and that found between the south dipping side of your anticlinal fold, no matter what the distance may be on the hanging wall of one to the hanging wall of the other, that the intervening quartz has, on one side of this body of quartz a northerly dipping structure, and on the other a southerly dipping structure, and is that true throughout from one to the other?

Mr. Lindley: One moment, Mr. Dickson. Do I understand you to mean that zone that underlies the arch of the crest?

Mr. Dickson: Yes; that intervening country.

Mr. Lindley: And intervening between the footwall of the north dipping and the footwall of your south dipping?

Mr. Dickson: Yes; or the hanging wall of the north dipping and the hanging wall of the south dipping. Do you mean to say that all that intervening quartz between the hanging wall of the north dipping, and the hanging wall of the south dipping, lying below the crest of the arch has either a south dip or a north dip——

A. Yes, I do mean to say——

Q. From one end to the other?

A. I do mean to say exactly *there*. I will illustrate, if I may be permitted, what I mean by that statement. Over the crest of the arch there is usually—generally a flatter lying footwall streak, which is a stoping streak the miners follow.

Mr. Lindley: You are now referring to the exhibit which you will kindly mark "Finch X 2."

632 The Witness: The stoping streak which the miner follows and have followed in a great many cases lies rather flatly like that (indicating). The stoping streak carrying ore,—a part of the vein. Stringing up on the south side and the north side of the vein there is one or more other streaks of a somewhat similar nature, and in some places also stoped so that there is one stope overlying another. Each of those best mineralized streaks in the vein are continuous over and across the ridge. Now that is the structure of the vein.

Mr. Dickson:

Q. Now below the lower arch or crest, will you draw a line there, a cross section from north to south, taking the bottom——

A. A horizontal line?

Q. Yes. What scale is this supposed to be?

A. No special scale.

Q. Well, for a distance in many places below the crest of this bottom roll represented here on "Finch X-2" have you not quartz, solid quartz, extending down twenty or thirty or forty feet, and occupying the intervening country between the two branches or sides of that fold?

A. I think that we are referring to the same thing when I state that the intervening quartz which you mentioned, is the solid quartz, not commercial, lying between the two ore streaks of the vein.

Mr. Lindley: Mr. Witness I think that counsel wishes to take you below your lower red line there?

The Witness: Well, if he takes me below the lower red line and the thing which I am attempting to illustrate, we pass from solid quartz into a fringe of stringers. The solid quartz which has
633 been mentioned by Defendant's witnesses, and I understand perfectly well, and it is a quartz which lies in this intermediate area and is developed, for instance 573 and 571 raises, and 569 raise, shown in the sketch.

Mr. Dickson: Well, take that section of the country represented in "Finch-2" lying between the two heavier streaks of ore or quartz, whatever it is, is that solid quartz from the south dipping to the north dipping side of your crest?

A. It is, in a number of places.

Q. To what depth?

A. Solid quartz, but non-commercial.

Q. To what depth?

A. You can get it exactly on one of the sections.

Q. I mean as a maximum, thirty or forty feet in places.

A. Here is a cross section precisely in which we can scale the width of such quartz.

Mr. Lindley: Referring to what cross section?

Mr. Dickson: Cannot you answer my question without that?

A. I am going to give you the distance, I will give it approximately from the model. Section three for instance illustrates that condition; section four illustrates a condition in which there is solid quartz for a part of the distance, the balance a combination of stringers, also for a part,—but in section three there may be a distance of forty or fifty feet of solid quartz.

Q. Now, that quartz does not carry any values when you say that it is not commercial?

A. It looks like solid and rather barren quartz, but it is solid vein quartz.

Q. It is a part of the vein?

A. Oh, yes.

Q. Now, does that in-ervening quartz that you have referred to on section number four,——

A. I referred to that on section number three, which is
634 similar in appearance to the vein and more solid quartz than this is.

Q. Which is section number four?

A. It illustrates the arrangement.

Q. Does all of that intervening quartz—and what I mean by intervening quartz, the quartz found in the intervening country, or the country between the hanging wall on your north dipping quartz, or strike of the roll, and the hanging wall of the south dipping side of the wall, have throughout, from end to end—have a structure either north and south or northerly and southerly?

A. No, it does not; it has a structure which conforms to the anticlinal roll.

Q. The cross fractures has modified it, the structure?

A. No, they have not; the structure was all made before these cracks were formed.

Q. Do you not have that intervening country in quartz which dips neither to the south nor to the north?

A. Oh, there is a point always in the anticlinal roll, where the thing in passing from one dip to another is almost horizontal.

Q. Do you mean to say that apart from that plane that that intervening body of quartz found anywhere between the crest of this roll, has either a dip to the north or to the south?

A. Oh, no question about it; its boundaries dip to the north.

Q. So anybody going in there could see that the quartz throughout was either dipping to the north or to the south, and if taken in places—I do not mean the mathematical plane, at the crest of a roll,—apart from that, more extensively than that, standing vertically, and in places dipping to the east and in places dipping to the west, instead of the north or south?

A. I will say with reference to that, that in the core of this mass of quartz at the summit of the anticline there are places which
635 you can look at and not see a definite structure of any kind, but, if you follow through the workings you will find overlying it and underlying it, definite streaks of ore which pass in the form shown by these darker colored lines, and that is the structure of the vein; the included quartz between those bands is so massive as not to show any dip or structure at all, merely because it is massive.

Q. Now, going back to defendant's model, Exhibit-A, as I understand you not only does raise 488, but Raise 2-A and raise 4-A, 5-A, 6-A and 7-A follow up from top to bottom the plane of the Siebert Fault?

A. They do except down to the bottom of a raise like 4-A for instance, the fault shows just beyond the bottom towards the north in the wall of the stope and then just a little above the bottom of the raise.

Q. And they go up on an angle to the south practically the same angle of the north winzes of the north side of your anticlinal fold,—on up, without any change in the angle of dip?

A. They have been so driven that they produce that effect, but they are driven upon a fault which has a dip differing from the dip of the north slope of the vein.

Q. But as those raises have been extended to the one in which the roll — taken, apparently, they have the same dip as the hanging wall on the north side of the vein?

A. Yes, because they are driven diagonally on the fault.

Q. You understood all along did you not, from the time that you first came into this case, that the Jim Butler Company had a stipulation with the West End company, by which it could have prosecuted by the West End company any piece of work that the Jim Butler company wanted done?

A. Yes, sir.

636 Q. If you thought these raises 2-A, 4-A, 5-A, 6-A and 7-A had been run up in such way to deceive or mislead, in the respect that you have stated, why didn't you suggest that another raise be put up on the true dip of the fault fissure, showing that it had a different dip from that of the hanging wall on the south dipping branch, or south side of your anticlinal fold.

A. It was sufficiently ovbious so that I did not think that it was necessary. The top of the fold is in position about as I hold the pencil, transversely across the raise, and the strike runs across on the outer edge and strike, finally to the north, so that the fault is perfectly clear.

Q. Is it true that the ordinary intelligent observer going in there and looking at these raises, and stopes, would get the impression that each of those raises went up on an angle of dip conformable to the dip of the hanging wall, of the south dipping, or north branch of the anticlinal fold?

A. They actually do go up—from the stopes.

Q. Do you think that you could have done work in that neighborhood put up another raise, that would have presented a different appearance, to the true appearance and would it show that the raise was, if it went up on the true dip of the Siebert Fault would be going up in a direction, angle, different from the dip of the hanging wall of the north branch of your fold?

A. Different in direction of dip, such a raise would extend in just about a due southwesterly direction and that would follow the actual dip of the fault, as it is developed in the Tonopah Mining company, and all this region. The dip of the vein at that place is considerably less than the dip of the fault.

637 Q. And you plainly observed that these raises have been so driven to show to the ordinary observer that each and all of the raises went up on the same angle, and direction of dip as that of the hanging wall as that of the north branch or side of your anticlinal fold, you did not direct that any additional work be done in the way of raises, which would disclose the misleading effect in this raise?

A. Oh, they do not mislead, except if they are intended to show the direction of the dip of the things which they follow, they do not do it.

Q. Well, you heard the testimony of the witnesses for the defendant, didn't you understand that that was their claim, that it went up on the dip of the hanging wall fissure?

A. I didn't know that they said that. It is easy enough to see; you can measure the angle or strike of it.

Q. Isn't the north branch or north side or north dipping side of this branch of your one vein in the fault and isn't it along a fault,—I do not say the Siebert Fault?

A. It underlies a fault plane.

Q. Doesn't it lie conformable to a fault plane?

A. No, I would prefer that the fault plane lies locally conformable to the vein; that is, it runs along the hanging wall of the vein.

Q. That is not the Siebert Fault?

A. Yes.

Q. The Siebert Fault lies in what form?

A. Only in that local sense, that it touches and follows the hanging wall for a certain distance.

Q. Do you say that the north dipping side of this north vein of yours does not lie in a fault, practically from one end to the other?

A. I do not think that is a Fault plane in the sense that there is any considerable displacement.

638 Q. Do you say that this north dipping branch or side of this one vein of yours, does not lie in a fault plane practically from end to end?

A. No, I do not think that it does. It — a fault plane,—it lies in a fissure zone, and the fissure zone may have had some displacement; to that extent it may have been a fault.

Q. Then is it your opinion or conclusion, from your observation, that the north dipping side of your anticlinal fold, lies in a fissure from end to end?

A. Oh, yes, that is true.

Q. And the dip of that fissure is conformable to the dip and course of the ore body?

A. Yes.

Q. And conformable to the strike and dip of the fissure?

A. Yes.

Q. From the most westerly end of the development to the easterly end of the development, in the West End ground, or the End claim?

A. That is true, true in both sides.

Q. That is true in both sides?

A. Both slopes.

Q. What is there at the bottom, I will say of four-A raise, and I do not confine you to the dimensions of the bottom of that raise,—but to the country immediately adjacent?

A. The bottom of the 4-A raise is followed curving over on the vein structure, immediately above the bottom and connecting with the stope is a very prominent quartz stringer, that goes right——

Q. Right up at the top of the stope?

A. It goes out of the top of the stope and passes up the raise a little distance and is cut off.

Q. How far does it pass up before it is cut off? Isn't there quartz in the top of the raise?

639 A. That prominent stringer is cut off about two thirds of the way up.

Q. So that two thirds of the way up 4-A raise, you have been following a body of quartz of considerable dimensions, clear from the bottom where you started in to stope up to that two thirds distance?

A. I will state however that it does not differ in genesis and character from that found at other points in this raise and the other ones.

Q. Well, we will get to that further on. Now, at the bottom of the 7-A raise, you have a stope there in the north dipping vein, or the northerly side of the anticlinal roll?

A. Yes, we have a stope that comes over and makes a sharp arch.

Q. Do you now go up in quartz in that stope without any interruption, up into the 7-A raise?

A. We go up into the stringer zone, 7-A is especially distinguished.

Q. You have quartz?

A. Little bodies of seams.

Q. It goes up following a body of little seams?

A. Crossing the seams and following a fault.

Q. From the bottom of the stope clear to the top, what would be the dimensions of the quartz body, that is followed up in 2-A raise?

A. There is not any quartz followed up; there is a number of stringers of quartz found, and some of them have been dragged along with the fault, so that fragments of quartz can be found underneath the fault and in it for a considerable distance.

Q. How about 5-A raise?

A. The same thing can be stated about 5-A.

640 Q. Haven't you there a body of quartz from two to three feet thick, which you followed up continuously for about forty five or fifty feet, up the 5-A raise—starting in the stope at the bottom and going right on up?

A. There is a conspicuous interlacing series of stringers going up 5-A raise for a considerable distance,—forty seven feet I think, as I measured it—and then that turns up against the fault and is cut off sharply and disappears.

Q. Did you say that you followed it from the bottom of 5-A raise upward for forty five or fifty feet, that it could have been anything but a solid body of quartz?

A. Oh, no, there are individual bands in it for considerable width.

Q. You have bands down in the stope?

A. We have bands down in the stope and extending up the hanging wall the condition is exactly similar, with reference to the stope at the bottom of those raises and the other stopes of the mine; there are stringers, sometimes big ones extending up into the back of the stope into the overlying rock.

Q. I am not speaking about that. Now in the stopes themselves below the hanging wall and below the foot wall boundaries, wherever it may be haven't you stringers of ore, quartz?

A. Those lighter areas—colored areas in the section between the

dark colored areas, represent the best mineralized areas,—these lighter areas are quartz seams.

Q. In the stopes?

A. Within the vein, yes.

Q. Within the vein, in the stopes?

A. In the stopes. Sometimes the little seams themselves are stoped, because the little seams running through it are rich enough to make it ore.

641 Q. Was there stopeing going on on the northerly side of this vein, I mean the north dipping side of the vein, during your examination made in order to prepare yourself to testify in this case, to qualify yourself?

A. I think not.

Q. Did you see any evidence of any recent mining there, stopeing?

A. No; I understand that the MacNamara has not been working for sometime, I know that most of the MacNamara workings have a coating of dust over everything, as if the work had been done a long time ago.

Q. If you had a clay gouge on the hanging wall of that north dipping vein, and the ore was mined out through a contact with the gouge seam, and the remaining gouge seam was left exposed to the influences of the air, wouldn't you expect it, to cleavage or fall off?

A. I think that has happened in some of those caved places.

Q. That is what you would expect speaking generally?

A. Yes.

Q. So you do not pretend to say, I take that, that there was not generally speaking, or throughout the stopes in the MacNamara vein, on that side of your anticlinal fold which dips to the north, a gouge seam on the hanging wall of the vein?

A. No, I would say definitely that there was a gouge seam on the hanging wall of the stopes which had caved and the gouged seam was the Siebert Fault.

Q. No, I mean apart from the Siebert fault. All these great stopes shown on Plaintiff's Exhibit-2, as extending from the crest of the fold northerly, are not on the Siebert Fault, are they?

A. No, a very small part of them.

642 Q. I am speaking of that particular body of stopeing,—you don't mean to say that when that stopeing went on from day to day or week to week, that a clay gouge was not encountered in the upward termination of the stope as it lay immediately beneath the hanging wall, that there was not a gouge seam separating the ore from the hanging wall rock?

A. No, I would like to be perfectly explicit on that. There is, outside of the area where the Siebert Fault touches the vein, there is usually a parting, sometimes with no gouge in it, and at other times very little gouge in it,—an amount of gouge which does not compare at all; very much smaller than the gouge of the fault, nevertheless, a small clay slip on the hanging wall in such regions for instance as this part of the MacNamara stope. There are similar gouges down in the West End, where the fault referred to as the

Edwards Fault, in cutting across the vein swings in and forms the hanging wall.

Q. I am not speaking of the relative size or the relative thickness of the gouge seam,—there may be larger in one of the faults than the other. But — I want to get at, is whether you are able to say that throughout these large stopes, following down from the westerly crest of the arch northerly, there was not a gouge seam lying between the ore and the true hanging wall rock?

A. No, the true hanging wall rock is very seldom developed. In very few places developed in the workings on either side of the ridge. There is a slip on the hanging wall, which has from almost no gouge up to a considerable, amount in the vein itself, between the ore shoot and overlying the vein matter.

Q. Have you reference to the little stringers?

A. Sometimes pretty solid quartz above the stope.

643 Q. Speaking generally of that line of faulting are you able to say,—I do not mean every foot of the way, but *wh*hat there is not found a gouge seam of clay separating the ore from the true hanging wall rock?

A. I will say that there generally is such a seam, as I have qualified it in a previous answer.

Q. And that seam is not as thick as the gouge found in the Siebert Fault?

A. Oh, no.

Q. Isn't the seam of gouge in the Siebert Fault thicker in some places than others?

A. Oh, yes,—that is characteristic of faults in general.

644 Q. And what is there, please, where you find in the Siebert fault a gouge seam not thicker than you would find underlying the tru*w* *handing* wall of the MacNamara vein, the north dipping vein?

A. I do not recall such place.

Q. What do you say as to whether or not the ore found in these raises, 488, 2 A, 4 A, 5 A, 6 A, and 7 A is ore or quartz in place, or drag ore?

A. Both.

Q. Which predominates?

A. Along the under side of the fault, the drag quartz predominates.

Q. The under side of the fault?

A. Yes; a short distance from it it is practically in place, although bent over, as I described it; at the top of 5 A raise, the Fraction vein comes up and turns over horizontally by the downward pull of the quartz.

Q. Where was the drag quartz pulled from? These raises go up to the cap rock, do they not?

A. Probably pulled away from quartz stringers near at hand in the foot wall of the gouge or fault.

Q. What are the dimensions of those raises, the ordinary size, 3 or 4 feet by 4 or 5 feet, I suppose?

A. Yes.

Q. This A series?

A. They are caved down in a number of places and enlarged themselves by falling in with the fault material, so they are a little larger than usual in places.

Q. And you think that the quartz found in thise places is drag quartz?

A. Not entirely, no.

Q. Was dragged in from some of those little seams that
645 have made out into the hanging wall?

A. Some of those little seams are right there in the raises.

Q. And where did the quartz that is in place come from?

A. Comes from the hanging wall of the vein, excepting the Fraction vein which shows in five A.

Q. What is that?

A. Excepting the Fraction vein which shows in 5 A.

Q. Will you get that Finch 1, please?

A. That came along from the Fraction fissure itself.

Q. We are not particularly concerned with the Fraction fissure just now. Let me see Finch 2.

A. (Witness does so.)

Q. Finch 3?

A. That must have been one of those prepared cross sections.

Mr. Colby: Finch 3 is cross section 2.

The Witness: May be identical with the glass sheet. One of the prepared sections.

Mr. Dickson:

(Q.) Finch 1 is probably what I had in mind. Pull down Finch 1.

A. Glass sheet No. 2 would be Finch 3. The second one.

Q. You have a perfect network shown on Finch 1 of little seams or fissures extending into the hanging wall and foot wall country?

A. I do.

Q. What developments are there along that plane of section to shows that?

A. Well, this is a section which might be almost anywhere.

Q. And was there any purpose, Mr. Finch, in drawing that portion of the section which represents a cross section through
646 this vein and placing it practically on a horizontal line with little undulations?

A. Yes, because I believe that is the form it had when it was made.

Q. It is not the form it has now?

A. No, it may have been changed.

Q. When do you think it had that form, how many centuries ago?

A. Oh, I don't know.

Q. It is a matter of conjecture whether it did have that form, isn't it, speculation?

A. No, the probabilities are that the rocks under which it was

formed lay much flatter and much more regular than it is now, because there has been a number of volcanic eruptions since this ore deposit was made.

Q. Those eruptive rocks would conform to the surface of the country as it was at the time they were poured over the country, of course?

A. Yes; oh, yes.

Q. And whether the surface of the country was then horizontal or even more irregular than it now is is a matter of conjecture?

A. Oh, yes. I would not be sure whether it still has approximately its original form or not.

Q. What are the thicknesses of these little seams which you have represented here on what you say would be considered an ideal——

A. As you see those passing up from the stopes all around the mine, they range from the thickness of a foot or more down to mere seams.

647 Q. Generally speaking, what are they? Just mere seams?

A. There are thousands and thousands more *more* little seams than there are the big ones. The big ones are rather rare, but they do occur. This rock shows the little seams and part of the replacement of the——

Mr. Lindley: Let us identify it so we — know it in the record.

Mr. Dickson:

(Q.) I wish you would mark this, Mr. Finch, before I ask you a question on it.

Mr. Lindley: "Finch X 3."
(Rock so marked.)

Mr. Dickson: Now, will you point out to us, point out to his Honor the little seams that you have reference to found in here going out into the hanging *ot* foot wall country?

A. These are little seams of quartz which I intended to represent by these lines stringing out from the vein, and they vary in size from this up to a very considerable width. But they have the same relations with one another, they interlace and branch out like the branches of a tree.

Q. These on here are simply mere thread-like seams?

A. Some of them are. Some of them are an eighth of an inch thick, a quarter of an inch thick, but they show the way they cross one another. Such material as that is found also within the vein itself between ore streaks.

Q. I did not hear your last answer.

A. Such a criss-cross arrangement of the seams is also found within the mass of the vein between the ore streaks of it.

Q. And sometimes in the stopes themselves?

648 A. And sometimes for a long distance into the hanging wall.

Q. How far have you followed them into the hanging wall, a

seam of any dimension? What I mean by any dimensions, 6 inches or so, or more than that, or a foot?

A. Oh, they have not been followed because they offered no attraction to the miners usually, but they are cut in cross cuts and raises at distances of as much as 50 feet or so above the hanging wall of the vein.

Q. Wouldn't it be quite speculative to undertake to identify those little seams where they are cut?

A. Oh, they don't go any distance.

Q. What?

A. No individual seam goes any distance at all, it turns off and intersects with others, just a mesh or net work like a chicken fence.

Q. No individual seam would be followed for any distance?

A. No, but they extend up and gradually disappear up the hanging wall of the vein, and they are just as much a part of the vein as the hair on a man's head is a part of the man.

Q. May be that *orio* or halo you spoke of. Did you follow any little seam or big seam which made out from the main vein into the hanging wall country or the foot country, having a size, quartz, unbroken quartz a foot or two feet for a distance upward of 30 or 40 or 50 or 60 feet?

A. Oh, yes.

Q. Or anything like that? Where, apart from these raises?

A. A series of them have been stoped in two different places. Have been stoped at least 30 or 40 feet above the main vein, the main body of quartz of the vein down in the Jim Butler.

649 Q. What has been stoped?

A. The hanging wall system of seams where they become specially large.

Q. Do you find any difference in the quartz which is in place in the A series of raises from that found in either the north dipping or south dipping branches of your 1 vein?

A. No. No, it is a part of the vein.

Q. Suppose, Mr. Finch, that we had every foot of the way from the West End—the east end of the west end claim to the westerly termination of the ore where you have this broken edge, the terminal edge, in your judgment, a series of raises like the A series of raises showing practically a continuity of ore in what you call the hanging wall, but above what you call the true top of the north dipping vein? Would you still say that they are small stringers into the hanging country?

A. If we found such stringers, I would not call them above the true top. The true top has not yet been reached if there are stringers.

Q. I did not hear.

A. The true top has not been reached if you are still having other stringers and going upward.

Q. I will modify the question: suppose we had at intervals of every few feet from the east end of the West End claim to the westerly termination of the ore raises going up from 30 or 40 or

50 or 60 feet showing quartz in place, and every one of them extending for those distances above the junction of the south dipping and north dipping branches of your vein, would you say
650 that the top of your vein was found at the junction below, or at the top of those developments that I have referred to?

A. I would say just the same as I say now.

Q. What?

A. I would say just exactly as I say now, that so long as a conspicuous stringer system existed, you are still in the vein.

Q. But, then, if you had the condition such as I implied in my last question, what would you call the top of your north dipping vein?

A. That irregular boundary where the silicification and the interlacing stringers becomes inconspicuous and changes into comparatively unaltered lode porphyry.

Q. I wish you would step to Plaintiff's exhibit C and starting at the westerly end point out the most extreme westerly ore developed on the 500 level in this vein, the south dipping vein? Start with the most westerly development of ore on the level?

A. Most westerly ore?

Q. Developed on that level, the 500 level of the West End?

A. As shown by the stopeing?

Q. Give us the figure there. In the vicinity of what?

A. You want it exactly on the level?

Q. On the level, yes.

A. It is not quite so far in the levels there as it shows in the stope above.

Q. I do not mean stopeable ore, but the vein cut on that level?

A. That is where it meets the dacite cap rock at the point where the two prongs branch out.

651 Q. From figures 1077—station 1077 on Exhibit I?

A. There is sstill some of the vein left over as far as 1078.

Q. At that level?

A. Yes.

Q. Well now, we will go on: take that level up from there easterly and state to the Court where on the level, either above or below it, you have ore exposed, or unmistakeable vein matter, a portion of this vein we are talking about?

A. It is unmistakeable vein matter——

Q. Giving the stations, Mr. Finch, if you please, so it will go into the record.

A. I was about to make the general statement that it was unmistakeable vein matter throughout the length of this level in this main drift. That is, if we start from the west end and pass around to the northerly drift. That is close to the sideline of the claim.

Q. They are both on the same level?

A. Yes, but this is not ore material. This is vein matter on one side of the drift, and that Edwards fault along here on the other. Then, there is vein matter continuously through the level around to the end of the stope at the end line of the West End claim.

Q. The east end line?

A. That is vein matter.

Q. And a portion of what we call the south dipping vein, and what you call, I suppose, the south side of the anticlinal fold?

A. Yes.

Q. For what distance, then, have you ore and unmistakeable vein on that branch of the vein, that side of the vein developed easterly and westerly on that level?

652 A. Well, the ore is probably just marked by the length of the stopeing.

Q. Well, give me the length on the vein then, first.

A. The length on the vein is——

Q. On that level?

A. In round numbers, about 1150 feet.

Q. Now, to what extent on that level, and giving the westerly and easterly termini of each stope, section of stopeing, have you ore developed, merchantable ore?

A. Of course, in answering this, I will have to state that there may be pay ore that I don't know about.

Q. So far as you know?

A. That is developed and has not been stoped.

Q. I mean developed ore; I think I said that in my question, ore developed?

A. Well, the best I can do is to mark these—to measure the length of the ore extracted. I am not sure that there is any more ore in the mine.

Q. No, we do not know whether there is or not, of course.

A. About 680 feet.

Q. In one place?

A. On the westerly ore body.

Q. Well, go to the easterly ore body?

A. About 650 feet.

Q. Another stretch of stopes at the easterly end?

A. Yes.

Q. You gave me or testified that there was a fissure extending to the deep from the top, or what was represented in red as south dipping vein on each of the sections A, B, and C, and that the ore, vein matter was found in and along fissures where those several

653 planes were taken. Then you gave me the course of each of the fissures. I will ask you if that was just a rough estimate, or whether you have taken notes of the course of the fissure as cut by each of those sections at different intervals and determine- what its average or actual strike was?

A. I took the average strike for short segments of the vein, as you asked me to, from the skeleton model of Defendant, and of course, it had to be rough to a certain extent on account of the difficulties in taking it.

Q. You do not mean that to be exact?

A. Oh, no, it was the best I could do.

Q. This Finch 5 is intended to repres-nt the workings in ore, vein matter, I suppose, on the 400 level of the mine west end 400 level?

A. Yes. Up to a certain time.

Q. Up to what?
A. There is a little development since that was prepared.
Q. Well, that is negligible, I take it?
A. Yes.
Q. Would not alter the picture very much?
A. Very little.
Q. You have here on this Finch 5, in the vicinity of where the working marked McQuillan shaft, a representation of a broad toe or curve, as you come along on the south dipping vein easterly and turn around that broad toe and go back on what we call the north dipping vein; is there any such picture as that shown on the working on that level?

654 A. Oh, it is shown beautifully.
Q. I will call your attention——

A. Let me point out where it is shown. The foot wall side is developed almost continuously in a cross cut which I now indicate, a cross cut starting from Station F 36 and extending southward. Immediately over that cross cut, not 10 feet above the floor of this level is a stope which has been made upon this foot wall streak. The representation of it on this plan is just merely the projection downward.
Q. I am speaking more broadly, or intended to, rather, to invite your attention, more specifically to the eastern boundary of that toe.
A. That line represented in the heavy color is the solid quartz. Beyond that, the only solid quartz is shown in these patches of heavier color.
Q. Have you examined the Defendant's exhibit G on that same level?
A. Yes.
Q. With some care?
A. Well, with some care, yes.
Q. I wish you to examine it with great care, and when Court convenes again, which will be to-morrow morning—but in the meantime examine it with extreme care.

Mr. Lindley: I think the witness has examined it sufficiently to be able to testify.

Mr. Dickson:

(Q.) Are there any errors in what that exhibit purports to represent, so far as this vein is concerned?
A. I think there are. That is my opinion.
Q. Point them out on this exhibit.

655 A. If this exhibit, by a solid yellow color starting in the region of station 403 S—if by that solid yellow color it is intended to represent a solid mass of quartz, I can not subscribe to the representations upon the map from that point eastward.
Q. Can you say that it does not represent the vein?
A. Up to the point beginning back further west on the yellow representation—up to the point I have mentioned, I would agree with it in every essential detail.

Q. Well now, at what point, 400 and——

A. In the region of 403 S.

Q. Now, from thence on easterly, do you say that what is colored in yellow on the Defendant's exhibit is not on the vein at that level?

A. That is what I say. What I do say is, from the point 403 S, the mass of solid quartz as distinguished from country rock with stringers in it, turns sharply to the south and bends back to the south east.

Q. I wish you to be sure you understand me, Mr. Finch. Do you say that from the point which you designated, from thence on easterly, what is colored in yellow on Exhibit D, Defendant's Exhibit D is not in the vein, but is outside of any vein?

A. It is in the vein in the sense that it is a part of the overlying partly mineralized country rock stringer system which is left and not cut off by the Siebert fault. It ought to be represented, I think, in a fainter color.

Q. What?

A. I believe it ought to be represented in a fainter color, or else the details of the quartz in it should be shown by some con-

656 vention.

Q. If we had two typical fissure veins in a general easterly and westerly course, I do not mean due easterly by any means, and they were converging in their course, as you went eastward, and dipping in opposite directions, and they came to a juncture in their course eastward, as you went east where they first intersected each other, from thence on easterly you would be following on a descending plane to the east, wouldn't you?

A. Yes. You mean following down the summit of the ridge, if I may be permitted to call it a ridge?

Q. Yes. Now, if a vein in its downward course departs at all from the perpendicular and it outcrops at the surface, but the surface where it outcrops is irregular, the course or direction of the line of outcrop would, of course, differ from the true line of the strike of the vein?

A. Oh, yes.

Q. And the extent to which the direction or course of the line of outcrop would *be* depart from the true strike of the vein would depend upon two factors, I take it, namely the degree of the departure from the perpendicular in the downward course, and the extent of irregularities found on the surface along the line of the outcrop?

A. Yes. I believe I will have that question read; there may be something in it I did not grasp.

(The reporter read the question.)

A. Yes, I think that is true.

657 Q. Of course, that follows——

A. Yes, I wanted to be sure I understood what you mean.

Q. If we had again two typical fissure veins which converged in their course easterly, their strike being easterly and westerly and their dip in opposite directions, intersecting each other on their course upward, if we followed them from the point of juncture east-

ward we would be going on a plane inclining to the east, as you said then if at any point from thence on east they were parallel to each other, then that plane of junction would be a level plane, without it?

A. Yes.

Q. Coming to you- terminal edge in the western portion of the mine for a moment again, you indicated on your wooden model the local dip?

A. Yes.

Q. In a southerly direction near that westerly terminus.

A. Slightly south easterly.

Q. Yes. And this terminal edge on the south dipping branch is shown upon this exhibit 4, called terminal edge on the local dip?

A. Oh, no.

Q. On the local dip?

A. No, it lies between the local dip and the local strike.

Q. Well, it is a side edge in part, at least, that is exposed there, a side edge of the vein in its downward course?

A. Oh, no.

Mr. Lindley: I understood him to answer no.

Mr. Dickson: He said it was between the plane of the dip and strike. I do not understand he has answered the last
658 question.

Mr. Lindley: Yes, he did.

Mr. Dickson:

(Q.) Do you understand that last question?

A. I certainly do, yes. It is not a side edge. Any outcrop of a vein that is on a sloping surface is going to differ from the strike by as much as it passes down the hill slope. But in this case the outcrop of the vein is well above the line of the dip.

Q. Well, as we follow from the crest here where you have marked the northerly side line of the west end, we pass over that line downward to and across the southerly side line of the west end, are we going down on their local dip, or approximately to it?

A. Oh, no. We are going on a line——

Q. Going on the strike?

A. I will tell you just what we are doing: we are going on a line that I gave, an approximation of this yesterday; may differ a few degrees, but something like 30 degrees away from the dip of the vein and flatter.

Q. That is from what you call the dip; this surface on Exhibit 4 is intended to represent, as well as you can, the surface of the country as it was, I take it, at the time these veins were deposited, or before the later eruptive rocks flowed over that surface?

A. The yellow part of it, yes.

Q. I mean the red part?

A. Oh, no, the red part is the top of the vein.

Q. That is what I say.

A. That is the back of the vein.

659 Q. And represents the surface as it was before the overflow of the cap rock?

A. Oh, no. No, this is the surface that was overflowed by the cap rock and it has trachyte and Midway andesite under it in the hanging wall of the vein.

Q. This is later than the formation of the vein, this cap rock, isn't it?

A. Yes.

Q. Well, at the time this cap rock flowed out and over this surface which now shows the top of the vein and came down, wherever it came down on its contact with the top of the vein, that must have been the surface at that time?

A. Oh, that was——

Mr. Lindley: In other words, let me understand the question myself. Do you understand that this vein was formed with the entire top of it there to the surface when this flow took place? Is that your question?

Mr. Dickson: No, my question is this. I do not care much about it one way or the other.

Mr. Lindley: The question strikes me as a little bit confusing because that would indicate the formation of a vein on the top of the surface, and this representing the surface.

Mr. Dickson: Oh, no, I do not mean anything of the kind.

Q. In a rough way, it is what is shown on Exhibit 4 now in red, you have removed the covering?

A. Yes, removed the hanging-wall rock up to the fraction dacite breccia.

Q. Does this represent what the surface was before that later outflow?

660 A. Oh, no no. This represents what the surface was before the later flow.

Q. Oh, there was another flow after this one?

A. No, this is the Fraction dacite breccia; this was the surface it found to cover.

Q. What was the surface before that outflow came?

A. Before the outflow of the Fraction dacite breccia?

Q. Yes?

A. Just this surface on the top of the model and the surface painted yellow. In the hanging wall of the vein, there was still a considerable amount of lode porphyry, and above that midway andesite was eroded into a hillside, and this hillside is shown in yellow upon the model.

Q. I wish you would go to your model exhibit 2. Start at the east end and at intervals of 100 feet follow up on the south dip—the south dipping vein, as we call it, to where you come to the top of that south dipping vein, assuming now that there was no other vein than the south dipping vein, where would you find its top?

A. You mean at the time when there was the surface there before the Fraction breccia?

Q. I mean where the top of that vein would be found now, if there were only one vein there? Where would you find it?

A. Well, you would find the top of it under this same breccia, and it is shown——

Q. What I want to do, Mr. Finch, it may take a little time, not very long, though, to start at either the easterly or westerly end, as you prefer, and at intervals of 100 feet therefrom go up on the
661 true dip of the south dipping vein until you get to what you call the top of that vein, if there was no other vein there.

Mr. Lindley: That is on the assumption that the vertical plane as drawn across dropped down across that anticline and nothing beyond it?

Mr. Dickson: Yes, that there was no anticlinal fold at all. Designate the place on the model.

A. I will have to hear the question.

Q. What?

A. The question is difficult to comprehend.

Q. I will ask the question again: start at the east end, or at the east end line of the West End claim, and taking what the Defendant claims to be the south dipping vein, not the Fraction vein or any other, and follow up on the line the true local dip until you come to a place on the model where you find the top of that vein, if it were the only vein in the ground.

Mr. Lindley: That is assuming that there was nothing rolled over on the other side.

Mr. Dickson: That is it, exactly.

Mr. Lindley: Well, the model evidently shows that.

A. You would follow that vein up along the series of dips something as I now indicate up to an outcrop against the Fraction dacite breccia.

Mr. Dickson:

(Q.) Well, if it would take you too long to answer that question—that is not what I wanted. My question was to take it at intervals of a hundred feet and fix the point upon the model where you found the top of the vein, assuming that there was but the one vein, or if two, that this was a distinct vein from any other? It won't take
662 you very long.

A. No, I don't think so. A series of stopes——

Q. I want *ti* done with some accuracy.

A. A series of stopes starting with the stope known as the old MacNamara stope, passing down through stope- 6 and 5, 3, 22, and 21, 23 and 18 in the east end of the claim would be passing down from the outcrop towards the south easterly corner——

Q. You are not answering my question, Mr. Finch. My question is starting here at the westerly end or easterly end as you please, and then at intervals of a 100 feet go up on the dip of the vein, its true local dip and fix the place on the model where you found the top of what we call the south dipping vein?

The Court: Do I understand that if he were going to follow the

vein as marked on that model that he would mark the 100 foot points?

Mr. Dickson: Yes, and then I am going to follow it with the question to give the line of connection on the top at the extreme east and extreme west.

Mr. Lindley: Of course, this question of giving the dip locally depends somewhat upon the datum and the plane upon which it is drawn. If the witness can understand the question and can accomplish what the Judge wants, I hope he will do so.

The Court: My understanding is that he wants him to distinguish at points 100 feet apart the difference between the two veins, if there were two, as in this model.

Mr. Lindley: No, he is eliminating the idea of two veins altogether.

663 We start in with the idea that there is not any other *other* vein, except the vein that dips to the south. Therefore, he must necessarily assume that there is exposed two terminal edges. Must assume that there is an exposure of two terminal edges. Otherwise we have no date to work from, if you consider that that is all the vein that is cut——

Mr. Dickson: I do not agree with Mr. Lindl*ye* as to the necessity of a terminal edge at all on the law of the case. What I want him to do, Mr. Lindley, if it — going to take too much time I won't insist upon it.

Mr. Lindley: I would like to have him do it, but I simply want to know if that is your conception, that there must be two terminal edges.

Mr. Dickson: I think that is not the dip of any vein. I understand that. According to our contention it would be the dip of the south dipping vein where it intersected and joined with the north dipping vein.

Mr. Lindley: Now, eliminating for the purpose of avoiding confusion the north dipping vein. Just take your hypothesis which gives the terminal edge in that direction. Whether it is the top or not depends on circumstances, but you then have that condition, two terminal edges, isn't that correct?

Mr. Dickson: Well no. We have two terminal edges we claim, but my contention is, and will be, when we come to that branch of the case that it is not necessary to have a terminal edge of a vein defined at its top under all circumstances.

664 Mr. Lindley: With the explanation that has been made, or the lack of explanation by both Counsel, I imagine by this time that the witness can proceed.

The Court: We will take the recess at this time. The case is continued for fifteen minutes.

(At this time a recess of 15 minutes was taken.)

665 After Recess.

The Court: The Jim Butler Tonopah Mining Company, vs. the West End Consolidated mining company.

JOHN W. FINCH.

Cross-examination.

Mr. Dickson:

Q. Do you recall what my request was Mr. Finch?

A. Before I proceed with that will you permit me to change a distance which I gave you on the map.

Q. Certainly.

A. I mistook this map because we are so in the habit of using a forty scale, I used the wrong side of the scale. The question related to ore development on the five hundred level.

Q. Yes.

A. About in round numbers 350 feet, is the length of the fifth level of the westerly ore body,—the length of the easterly ore body is about 650 feet I stated.

Q. All right, that the total distance that that level is drifted in the vein is correct as you gave it?

A. About 1,150 feet, yes.

Q. You may proceed, Mr. Finch.

A. As I understand your question you wish me to assume that the southerly part of this vein ends along a certain line which I have spoken of as the crest.

Q. What I want you to do is just as though you were going to drive a raise up, following the vein up to find its true top locally; you would follow up on the true local dip, until you came to what you regarded as the top of it; that is what I want you to do and fix it on the model so far as you can. Not especially for this court but more for
666 the appellate court, if it should be carried there.

A. I cannot do that without assuming that that vein which I believe to be continuous is not continuous.

Q. I have asked you to assume that and fix on the model, and mention the places within a hundred feet of where you find it, the top of the south dipping vein, *in* that were the only vein, or if it were not a separate and distinct vein.

Mr. Lindley: Without regard to the side or end lines of the claim?

Mr. Dickson: Yes, but within the end line.

Mr. Lindley: Without regard to either side or end lines. Of course, the end lines of a claim do not have to be on its true dip, and the angle at which it cuts a vein is entirely immaterial.

Mr. Dickson: Regardless of that; the true local dip. The question seemed to be plain enough.

A. And regardless of the dip as I understand it?

Q. Yes, you regard the dip as being to the east; I understand that. The question is asked you that you assume that there is but one vein, and that the south dipping vein, or if there be any other vein it is entirely a separate and distinct vein from the south dipping vein, and the dip of which is generally southerly. I want you to start at or near the east end and travel westerly, and at intervals of one hundred feet affix on the model, where under those essentials the top of the south dipping vein would be found.

A. I will have to get you to fix for me the top where it would be found. I cannot do that.

Q. Why not?

A. Because you did not reach a top, but you get up to a top where it is horizontal and in your stopes on the exhibits
667 colored red and yellow.

Q. Go to our model where the two veins, as we contend, and the one vein as you contend, is shown in its separate colors?

A. I can run up to the point where you say that one vein ends and the other begins. At the exact end line of the claim to follow up on the local dip of the claim, you go from the south sideline in a direction almost due north, at that point.

Q. Fix the point where the top is, treating that as a separate vein.

A. I am assuming your hypothetical question. You pass up 569 raise, up to a certain point in the red representation where the quartz turned flat and then you pass flat over to your yellow line of demarcation in a northerly direction. The next hundred feet would be almost identical in a general direction,—if that is what you want.

Q. I want the top, upon the assumption embodied in the question, going up on the true local dip.

Mr. Lindley: Well, it seems to me that 'true and local dip' is a confusion of the term. The true dip is always at right angles to the strike, which cannot be a true dip and local dip at the same time.

Mr. Dickson: I think that if the vein changed in dip it changed in strike. If we have local changes in the strike we have local changes in the true dip.

Mr. Lindley: Well, your top there plunging line and not a horizontal line, from which the dip and strike is calculated.

Mr. Dickson: I do not see how the witness can have any difficulty.

Mr. Lindley: I don't either and I would dispose of it in about two minutes if it was me.

The Witness: If you can suggest,—there are so many
668 hypothetical matters in it that it bothers me.

Mr. Dickson:

Q. Well all that you have to assume, all the assumptions that you have to make are one or two,—that if the south dipping vein is the only vein, or if there be another, the north dipping vein it is a separate and distinct vein from the south dipping vein. Now, with that assumption follow up from the true local dip at intervals of one hundred feet, and tell the court where the top of that south dipping vein is found?

A. Well, Judge Lindley, I don't see how that is easy because I cannot fix the point that he is asking for.

Mr. Lindley: Well, instead of taking the hypothetical question that the Judge is asking, I am taking what is going through his mind.

Mr. Dickson: What is that remark?

Mr. Lindley: My deductions are made from what you want the

witness to testify to, rather than what is gleaned from the hypothetical question, and in that respect I made the remark and that is all, Judge. I did not intend any disrespect at all.

Mr. Dickson: Well, I did not hear the remark but I saw a broad smile go around and I just wanted to enjoy the joke.

The Court: He said that he was telling what was going through your mind.

Mr. Lindley: If you cannot answer the question with that hypothesis, all you have to do is say so, and if you can answer it do so, Mr. Finch.

A. The question involves my answering where the top of
669 that vein would be, now I cannot find any feature which indicates the top of that vein, where it passes over that roll. I can take a definite and arbitrary point, which is practically the summit of the roll, if that would be satisfactory—and a raise to be driven at the end line in practically a northerly direction, and would follow in that direction practically on the dip of the vein, up to a point where the dip changes towards the north, which is approximately the point shown between the red and yellow coloring upon Defendant's Exhibit. 100 feet further west——

Q. I would sooner you would go to our model and fix the point.

A. I cannot fix the point.

Q. Go to the point where you found the highest southerly dipping ore, can you do that?

A. Yes.

Q. Do that please. Go to our model.

A. It takes a plan map to fix the location at hundred foot intervals. There are no cross section co-ordinate lines on this model.

Mr. Lindley: There are cross sections on ours, perpendicular to that line, at hundred foot intervals.

Mr. Alling: There are on our model, too.

A. Passing upward from the south side line, about one hundred feet west of it, a raise would be driven also in a northerly direction upon the dip of the vein up to the highest point.

Mr. Dickson:

Q. On southerly dipping ore?

A. Somewhere in the top of 573 raise, at the point where that raise as a working bends over. I have got to get a plan map of some kind.

Mr. Lindley: Well, I misunderstood you- question Judge, I thought that you called for the highest point in the south dipping
vein, and that must be away up in the MacNamara end, in-
670 side of the east end. I understood you to ask the witness to go to the highest point where the ore was.

Mr. Dickson: I meant the highest point on what we call the top, not what you call the top.

Mr. Lindley: The highest point in a given section.

Mr. Dickson: Yes, at intervals of one hundred feet. I mean a vein with an easterly and westerly dip.

A. A raise driven to come up to the top of the south dipping vein, 300 feet west of the east end line, would reach the top part, about at

the bottom of 6-A raise; its direction however would differ slightly from the direction of the last two raises and would be in a northwesterly direction.

Q. That is true to a turn in the dip?

A. Yes, a local change in the dip. A raise driven to go up 100 feet further west, would start on the southerly dip and turn in a curve.

Q. Where would the top of the south dipping ore be found?

A. I had not finished that. Would turn in a curve to a direction almost due northwest, and would go up in the vicinity of raise 478.

Q. Fix it as definitely as you can, if you please?

A. Yes; about 500 feet from the end line; such a raise would have almost a due northwest direction of dip and would come up at about raise 477.

Q. Point that out. Here you will find the top of the southerly dipping ore?

A. Yes. Where it would stop dipping to the south. 600 feet from the east end line the dip would also be from the south side line upwards for approximately, to the 400 level, would be in a northwesterly direction, and then latterly it turns a little more towards the north, and would reach the point where the dip would
671 cease to be a south dip,—just an uncertain distance north of 473 raise.

Q. Where is 473 raise?

A. (Indicating.) Somewhere between 473 raise and,——

Q. It is not developed there?

A. It is not developed there.

Q. Take the next one.

A. 700 feet from the east end line would be not far from the,—a line not far from the Corkhill shaft, a north and south line, but in driving up on the dip you first start in a northwesterly direction and then continue in an almost due northwesterly direction up to an undeveloped point lying under the two hundred cross cut, or for some distance in the direction of the dip, would take it up right in here.

Q. Immediately above——

A. It would reach the highest line in such a cross section, somewhere just a little south of 367 raise in the MacNamara, it looks like. 800 feet west would go up on a northwesterly dip, and would go up also into an undeveloped point. 900 feet west, it would go up on a similar dip and come to the summit somewhere in the region of 203 Raise. The summit is not definitely developed there. 1000 feet from the east end line the dip would be a curved line, as in all these cases, having a general direction downward on the south slope, northwest and would reach the summit under the——

Q. Reach the top of the south dipping ore?

A. No; it would reach the highest point, the vein dip south, under the level marked 104, not exactly developed. 1100 feet from the east end line, which would be somewhere in the region of your section D, the dip would also be in a northwest direction, and would pass up to the line between the yellow and red in the old MacNamara stope.

Q. In the vicinity of raise-A?

672 A. Yes. 1200 feet is about the last raise that could be driven. That would come up in the westerly end of the summit of the old MacNamara stope and would be driven upward in a curving northwesterly direction.

Q. Well, where would you come to the end of the south dipping ore—whereabouts?

A. About where you have shown your line between the yellow and red, changing from one dip to the other.

Q. Taking a line—connecting these points where you found, or say would be found the top of the southerly dipping ore, approximately what would be the course of that line to your terminal edge,—at westerly termination of the ore? Pretty nearly at right angles wouldn't it?

A. It would be a curving line sloping downward in an east direction, and not at right angles with the entire edge of the vein shown in this small model.

Q. Take a line connecting the most easterly and most westerly work where you find the top of the south dipping ore, what would be the course of such a line with reference to the course of the westerly terminal edge that you have spoken of?

The Court: The terminal edge has two direction-, one on the south side and one on the north.

Mr. Dickson: Yes, but he gave the average course as north, 5 degrees east, I think.

The Witness: No it was local. That was only for a limited section of it.

Mr. Dickson:

Q. Well, what is the course of your terminal edge, the average course?

A. Take it clear across the map here, and it is——

673 Q. What is the course of the strike of this vein as you claim it to be? Put it that way.

A. I will have to determine that. About north seventeen or eighteen west.

Q. What is the course of the strike as you term it?

A. That is the course of the outcrop in that area.

Q. What is the course of the strike of your vein or veins, which you say has a northerly and southerly strike?

A. That can be very well shown by taking two extreme points on a level, as on the 300 West End level, which it goes clear across. It is about north thirty west.

Q. Didn't you give the course 5 east?

A. Yes, that was for a part of it.

Q. For a part of the strike?

A. Yes.

Q. Now what is the course of the line connecting the most easterly and most westerly places, where you found the top of the south dipping ore?

A. About north eighty-two west.

Q. No veins are regular either in their course or dip, that you ever saw, are they?

A. Not absolutely regular.

674 Q. Most of them are very irregular both in course and dip from point to point?

A. That is particularly characteristic of contact veins.

Q. Well, most veins, whether they are contact veins or veins of impregnation, or bedded veins or fissure veins, generally speaking, they vary considerably, both in course and dip from place to place, isn't that true?

A. Well, yes, there is a very wide difference between them. For instance, such veins as the Smuggler, Mendota vein in the San Juan Mountains.

Q. Speaking generally, there is a very marked——

A. That is a straight vein; extends two or three miles. That vein does not change very much, but it is somewhat exceptional.

Q. I say, speaking generally of veins, isn't that true?

A. They are not absolute planes in any case.

Q. I did not use the word *word* "planes." I say speaking generally of veins, v-e-i-n-s.

A. Yes, I understand you.

Q. Are there irregularities both in course and dip?

A. There are in a great many cases.

Q. And in most cases that is true, isn't it? Did you ever see a vein that pursued a straight line from end to end on its course, and had an unvarying dip from top to bottom, in your life?

A. Oh, with small local variations, I have seen some veins with remarkable regularity; the Brum Lummon vein.

Q. You are speaking of some vein that is specially regular?

A. Yes.

Q. I am speaking of veins generally, not taking special cases, is it not true that they vary considerably, quite widely from place to place, both in dip and in strike?

A. They very often do.

675 Q. That is what I want.

Mr. Lindley: You asked him if he ever saw one that ran straight and he is telling you about it, Judge.

Mr. Dickson:

Q. Is it anything unusual at all, when you go downward on the dip of the vein to find irregularities in the dip, swells, bulges, in any vein?

A. No, pinching and swelling and local changes of dip and strike are quite characteristic.

Q. You find them going down,——

A. In veins of most types.

Q. You can find the same vein at places going down at its dip at varying angles almost from the horizontal to the perpendicular can't you?

A. Certain classes of veins, yes.

Q. And with swells in the vein?

A. Yes.

Q. Undulations, folded out owing to the increased thickness of the ore?

A. Yes.

Q. To what extent from your observation, if at all, has the vein or veins that we are dealing with replaced the country rock, mineralized it, by the process of replacement?

A. By far the greater part of the quartz in the vein is formed by that process.

Q. Well, to what extent from the fissure or fissures which you take to be the channels of circulation to the solutions has the country rock been replaced by the solutions and converted into ore or unmistakable vein matter?

A. Most of the unmistakable vein matter is formed in that way, but, if you will permit me to indicate what I mean in the
676 corner of Finch Exhibit 1; The fractured zone forming the fissure shows some of the angular fragments of the trachyte which were replaced by the silica. Now those——

Q. Well, we will talk about those later. Speak about your main vein.

A. I am talking about the vein as a whole and about the unmistakable ore in the vein. We find in the ore traces of the outline of the trachyte rock which was replaced and has been changed entirely into quartz. So far as I have represented for the benefit of the Judge the fragments of the country rock which have been now entirely changed to quartz, that was replacement. But, in the interstices, or cavities, between these little fragments of rock, another type of quartz was deposited which filled openings in the unmistakable, as you say, the commercial part of the vein, even there by far the greater part of it was replacement of the trachyte.

Q. My question was how far from the channel of circulation, the fissures, has this process of displacement extended, the greatest distances, how many feet?

Mr. Lindley: Well, this is the first time you have asked that question, Judge. Did you ask it before?

Mr. Dickson: I think I did.

Mr. Lindley: I beg your pardon. Go ahead.

Mr. Dickson:

Q. Into the foot-wall country, for instance, how far from the line of fissuring?

A. Extends out, oh, 40 or 50 feet in places. Extends out a very short distance in other places, especially in this middle section where no stoping is seen on the model there is much less extension of silicification.

Q. That was made out to a very considerable extent near
677 the crest of this fold, between the hanging-wall of the north dipping branch and the hanging-wall of the south dipping branch of your anticlinal fold, the intervening country has been replaced by the solutions that flowed through these channels of circulation, has it not?

A. Well, I am not sure of that. The development up around the crest of the anticline——

Q. I mean the works immediately below the crest that you have been into.

A. I am attempting to answer your question, sir. In that region the development is so thorough, there are so many openings that a great amount of this replacement of the country rock is seen. At other points where there is similar development, it is also seen. There are other regions, for instance as those which I indicate to the southwest of the West End shaft——

Mr. Lindley:

Q. On "Finch 5"?

A. Yes. Where on horizontal plane there is 150 feet of width of very nearly solid quartz, and a certain amount of replacement extending still further.

Mr. Dickson:

Q. You could have answered much more briefly if you knew what I was trying to get at. Would not the extent of replacement here indicate that this rock underlying the hanging wall of the north dipping, and the hanging-wall of the south dipping sides, or branches of your anticlinal fold, especially at the crest of that fold, and for some distance vertically or beneath it, indicate that that rock must have been quite soluble in order that it could have been so attacked and so replaced?

A. No, it indicates more than that. It indicates——

Q. Well, solubility must be one element that enters into it?

A. Yes, but just as important as that is the proper fracturing and crushing up in the process of fissuring so that the solutions can attack it.

678

Q. The greater the amount of fracture, therefore, the greater access for the circulation of the solutions, and that would be one element?

A. Yes.

Q. And another element, of course, would be the degree of solubility of the rock?

A. Yes.

Q. Those two together?

A. This rock is the lode porphyry of the district and is favorable to replacement of that kind.

Q. Owing to the solubility of the rock as one factor?

A. Yes, especially on the hanging-wall side.

Q. Are there any places where you have followed up on the south dipping vein, or the vein where the quartz dips to the south, where you have come to an abrupt change, as cut off by a knife-blade from the south dipping structure to the north dipping structure? Not a gradual bending over, but an abrupt change.

A. Yes, I find that condition in many points in the mine.

Q. At the point of junction of the south dipping and north dipping branches?

A. Yes, we find that sort of fractures there, and you also do not find them.

Q. And you find it where there are no fractures, an abrupt change, don't you, from the south dip to the north dip?

A. No.

Q. Let me call your attention to some particular points: In raise 569, 20 feet below the hanging-wall of the north vein, or
679 twenty feet under it, don't you—not downward, under,—don't you find there an abrupt change from the south dip to a north dip?

A. Oh! You find an abrupt change from the dip of the vein to the dip of the——

Q. The dip of the material in the vein, the quartz.

A. Yes, and the dip of the little intersecting fracture, then the dip of the vein goes on.

Q. Is there a fracture there that accounts for the change in the dip?

A. There isn't any real change in the dip. It is about horizontal at that point.

Q. Wait a moment: I am not going to waste time on that. Then, I understand you to say that, as you go up raise 569 to a point 20 feet below the hanging-wall of the north vein, there is no abrupt change in dip such as I have——

A. Only in a very local way.

Q. What?

A. Only in a very local way.

Q. Well, is there any?

A. The same sort of rolls and patches that are in the vein at other points, there is that change. The sketch shows it marked "Finch C."

Q. At raise 571, 20 feet below the 400-level, do you not have an abrupt change from the south dip to a north dip?

A. No.

Q. You do not?

A. Except a little undulation at two or three points.

Q. Do you find it there, or not, where the south dip stops and changes abruptly to a north dip, and from that on have nothing but the north dip?

680 A. Raise 571 goes over in a very smooth arch in a general way, and in an accurate way it shows the change of dip.

Q. There is no abrupt change at that point?

A. Except for little turns here and there, a foot or two or three feet in the dip.

Q. And is there, or not, an abrupt change in dip at the place I have called your attention to?

A. Nothing special at that point.

Q. In raise 4A, where the 3a raise connects with the stopes on the south vein, that would be the bottom of the raise, have you not there an abrupt change in dip from a southerly to a northerly dip?

A. No. I will state the reason why.

Q. Well, no; if it is not there that is all I care about.

Mr. Lindley: He has got a right to state his reasons.

A. The vein is two streaks entirely, two streaks that have been mined. The upper one runs as shown upon Sections 3 and 4 which

are in that region, runs up and curves over very sharply. The lower one curves over in a very flat and regular way. The average of the vein would be a line drawn through the middle of the vein, and such a line would not show any abruptness in dip.

Mr. Dickson:

Q. Are you paying attention to the particular point that I invited your attention to?

A. This is very near at hand.

Q. Raise 4A, where that raise at its bottom connects with the stopes in the south vein?

A. I understand precisely where you mean, and I have illustrated the conditions that exist there.

Q. And you say there is no abrupt change in the dip there?

A. No, not on the center of the vein.

681 Q. Raise 5A, 1 foot below the hanging-wall of the north vein and over the stopes on the south vein, have you not an abrupt change in the dip?

A. 5A?

Q. Yes.

A. It is about the same as it is here.

Q. What?

A. About the same situation that is shown in this cross-section.

Q. That means that there is no abrupt change observable there by any man?

A. Not as I interpret it.

Q. Is the Fraction dasite breccia faulted by the Siebert fault?

A. Yes sir.

Q. Can you point out some places? Fix them definitely.

A. Raise 152, which is the raise that passes upward into the 136 level of the Porcupine shaft.

Q. That is raise 152 on the maps of both parties?

A. I think so.

Q. Some other one place.

The Court: It is now half-past four.

Mr. Dickson: I can finish in a few minutes, if your Honor please, I think.

Q. Do you find any places where the Fraction dasite breccia cuts into and across what we call the south dipping vein?

A. Yes.

Q. You do find it cutting into it?

A. Well, resting upon the end of the vein.

Q. Do you find it cutting into it?

A. Well, that, we can hardly speak of that breccia as cutting into anything.

682 Q. Well, you could understand if that is what you call the Fraction dasite breccia, if there was an upthrust there, carried that material up from below, that it would cut the country, wouldn't it,—cut through the vein, cut into the veins? Now, what I want to know is in that sense if there is any place where you find what we call the Fraction dasite breccia cutting into the south dipping vein?

A. No, I do not find any such thing.

Q. You say there is no such place?

A. No, I haven't seen any such place. You find the edge of the vein there very much as the edge of the other vein.

Q. I am not speaking of the edge.

A. I do not know what you mean.

Q. You do not know what I mean?

A. I have not seen any such place, where the Fraction dacite breccia cuts anything. It rests upon the underlying rocks.

Q. Do you think that this Fraction dacite breccia was deposited where it now is by a flow, or that there was an eruption there?

A. Both.

Q. Both?

A. Yes. There are some layers in it that seem to have flowed in the form of mud.

Q. So that along its terminal edge you have evidences of an eruption?

A. Oh, no.

Q. That is what I am speaking of.

A. No evidence; a great deal of evidence to the contrary.

Q. Then, according to your observation, all the evidence is that the Fraction dacite breccia found along this terminal edge that you have spoken of has flowed there?

683 A. Has either flowed there, or settled down there from an unknown source from a distance.

Q. And was not the result of an eruption in that vicinity?

A. No; not any known point in this vicinity. What I mean by that is that the nature, the surface of the Fraction dacite breccia shows no evidences of having been thrown up through the other rocks. It shows a great deal of evidence to the contrary.

Q. Do you know what was spoken of by our witnesses as the Brougher Mountain dacite?

A. Yes, I have been up——

Q. Is that the same as what you call the Fraction dacite breccia?

A. No.

Q. What is the difference? Where was one found, and where the other?

A. That is a much solider rock. This little house that stands at the entrance of the courthouse is made of Brougher dacite; rather firm, solid rock.

Q. How does that differ from what you call the Fraction dacite breccia?

A. Quite loose rock.

Q. What?

A. The Fraction dacite breccia is quite a loose rock.

Q. And the other?

A. And the other is quite a firm, solid, compact rock.

Mr. Dickson: Well, there will be a few more questions.

The Court: The case is continued until tomorrow morning at 10 o'clock.

[End of Volume I.]

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15.

Wednesday, December 16th, 1914—10 o'clock a. m.

Mr. Lindley: May it please the Court, I desire to make a suggestion for the benefit of all sides, as well as the Court. In the progress of this case, it has become necessary, and undoubtedly will *be* become necessary before its close, for each party to do certain work in certain sections of this mine, and I would like to have it understood that the work that is to be done on either side is not to disturb the *the* showings that now exist, and which have been put into the testimony.

I was advised last evening that certain upraises are being made in the neighborhood of the west stopes on the MacNamara and West End, which might have a tendency to shatter those walls, and modify the conditions.

Now, if that work can be done without doing that, why, of course, we have no suggestion to make. But if it is necessary in blasting, in making those openings, that it will disturb the conditions of those walls, I would like to suggest that the Court make the inspection of that section of the mine before that work is done, and then they may go ahead and shoot all they please.

In other words, I am anxious, and I think that all ought to be, that the statue quo, so far as the existing developments be maintained until the Court has an opportunity to see these important points.

Mr. Dickson: I think I know what Mr. Lindley has in mind. There was some complaint made, or properly speaking, some criticism made in the cross examination of some — our
685 witnesses of the fact that we had one raise in the westerly portion. This A raise was the only one, while at the easterly end, we had a number of raises there going out like fingers. In view of that criticism, we have concluded, and have started, one or two—one raise, I am sure, easterly of the raise A. We do not intend in starting that to break what they call the crest of that fold any more than it is broken where raise A goes up; not at all.

Mr. Lindley: Well, my people have advised me last evening that it would have that effect. Of course, we do not want to take any chances on it.

Mr. Dickson: No, the raise is already up, the one I have in mind is already up above the crest of what you call the fold, going up just as raise A did. We want to show if we follow this vein to its utmost termination that it does not form a crest.

Mr. Lindley: I understand the object of it, and I would not have mentioned it if my engineers had not made that suggestion. And all I am anxious—I am glad to have you do the work, but all I am anxious for is that it shall not disturb the physicial appearance.

Mr. Dickson: I think we both understand that his Honor, from his connection with some litigation in which this same section was

involved, is doubtless familiar with the appearances there as they are now.

Mr. Lindley: That is a long while ago and we do not want to trust to recollections.

Mr. Dickson: We have no objection to the Court going down now and looking at it, but the raise is already above the crest of the fold and it has not disturbed the walls there, so I am informed.

686 Mr. Lindley: I merely mentioned it, Judge Dickson, so we would have an understanding about it.

Mr. Dickson: I do not want to—we haven't any right and do not intend to do that.

Mr. Lindley: I do not mean that you intend to disturb that situation, but my people expressed a fear that that would be the result, and I thought to avoid all question, the Court might go and look at that particular point; it won't take but a short time, and then if you destroy it, it will make no difference.

Mr. Alling: We have 60 or 80 feet in the crest there of that so-called roll, and 4 feet, more or less, won't make any great change in the appearance.

Mr. Dickson: I have no objection to the Court going and looking at that whenever he desires.

The Court: I am willing to go at any time, and as often as Counsel wish.

Mr. Lindley: I think it would be well to avoid all question, if the Court can go down with an engineer on each side and look at that place at this time.

Mr. Dickson: All right; there is no objection.

Mr. Lindley: Now, there is another thing I would like to call the Court's attention to, and Counsel; in the testimony of the witnesses, there is going to be a confusion here in an important raise, which is raise 152 on the Defendant's model, and we have been referring to it on our model also by the same number, and that is a mistake. I understand that the raise that you refer to as 152 is our raise 262. Is that right?

Mr. Finch: That is right.

687 Mr. Lindley: That is a misunderstanding.

Mr. Dickson: 152 on our model is 262 on your model?

Mr. Finch: Yes.

Mr. Lindley: So that may be understood. We assumed that we had the same system of numbering, so that the testimony of the witness when it is transcribed we may correct it so as to insert that 262, or the equivalent of that.

Mr. Dickson: There is just one place where he said in answer to a question of mine that they were the same on both models.

Mr. Lindley: So that there will be no misunderstanding.

Mr. Dickson: A few questions further only on cross examination.

The Court: I did not call the case, but we will consider it called, already.

Cross-examination of JOHN W. FINCH, resumed.

Mr. Dickson:

(Q.) You, in your direct examination, Mr. Finch, alluded to a place in what was called the Ohio territory where you had seen this same vein disclosed?

A. Yes.

Q. Will you point out, as nearly as you can, where that is with reference to the most westerly working on what we call the north dipping vein, as shown on the model?

A. It is not on the model.

Q. No, I say where is it with reference to the westerly termination of the ore on what we call the north dipping vein, as shown on the model?

688 A. It is not on the model.

Q. No, I say where is it with reference to the westerly termination of the ore on what we call the north dipping vein, as shown on the model? Where, with reference to that westerly, how far?

A. Well, the stope to which I referred is just beyond the end of the model.

Q. About how far west or north?

A. With reference to your raise A?

Q. Well, it is north, as I understand, of the stope shown either on your model or ours at the west end?

A. It is a little over 300 feet northerly, and about 500 feet westerly.

Q. 500 feet westerly of anything that is shown on Plaintiff's model, exhibit 2?

A. Oh, no; no.

Q. Well, that is what I am asking.

A. I understood you to ask me how far north and west it was of works which the west end had done.

Q. Oh, no. How far north and west, if at all, is the place where you have this same vein developed in the Ohio territory of the north westerly extremity of the stopes shown upon Plaintiff's exhibit 2?

A. Only about a hundred feet farther west.

Q. And how far north?

A. In about the same relative position, so far as north and south is concerned.

Q. It is not very much if any further north, but about a

689 hundred feet west. Could you give the distance west definitely?

A. The model ends upon the stope which I now indicate (showing). The other stopes shown upon the plan map exhibit 1, extend about 80 feet west of the stopes shown upon the model, and about the same relative positions. Two separate stopes.

Q. Can you give a station number in each of the stopes which you refer to as being in the Ohio territory? One station number will do in each stope.

—. —.

690 Q. Can you give me the station number in each of those

places which you refer to as being in the Ohio territory. One station number will do in each stope.

A. One of the smaller stopes is at the mouth of the cross cut leading around from the West End into the Ohio, at station 325,-A. W.-4, another little stope of a similar nature is in the region of A.-W.-14; and then there is still another stope or raise further north.

Q. Not shown?

A. Not shown upon the map, because it has been done very recently.

Q. Any further to the west?

A. A little further to the west,——

Q. About how much further to the west than the two which you have just referred to?

A. It is the end of the cross cut in blue marked 300 West End, where the ore body has been developed again and followed up in a raise. I don't know that it could be called a stope.

Q. It is the same vein, in your judgment?

A. Oh, yes, undoubtedly.

Q. How far would that last stope on the vein be west of the northwesterly extremity of the stope as shown on Plaintiff's model exhibit-2?

A. About one hundred feet west, no about one hundred feet north of the northwest extremity of stopes.

Q. You can plan the scale,——

A. It is measured along for a considerable area, but the distance is one hundred feet west,—100 feet north of the westerly stopeing done on Exhibit-2.

Q. Have either of those three stopes which you have just now referred to been followed upward to a termination? If so, against what does either of them terminate?

A. Oh, yes. The stope first referred to at the mouth of the cross cut leading from the West End mine, the ore in that stope
691 has been followed up to the terminal edge of the vein against the Fraction breccia.

Q. Have either of the others been followed up to a contact with the Fraction breccia?

A. Not when I saw them last, a few days ago; they lie to the north and down the slope of the vein.

Q. What you have spoken of, Mr. Finch, as the Fraction Dacite breccia, you understand is what some of our witnesses have spoken of,—that is, at this westerly terminal edge, so called, does what you call at that place Fraction dacite breccia, what you understand our witnesses to call Brougher Mountain andesite?

A. Yes, we are referring to the same rock body.

Q. I beg your pardon.

A. Those terms we are referring to the same rock body in the testimony.

Q. I wish you would put up one of the Finch sections,—Finch-2 or Finch-3; I want to ask you a question.

A. Which one,—do you recall?

Q. One where you had the northerly dipping vein faulted?

A. Oh, yes. It will be section 5 or 6.
Q. It is near the westerly end of the MacNamara.
A. This is one of them.
Q. That is the one I had in mind.

Mr. Lindley:

Q. One of the sections or one of the cross sections. There is another cross section behind that table.

The Court: There are three of them here, No. 8, No. 4 and No. 1.
Mr. Dickson: Which one is this?
The Witness: Finch No. 7. Being section 13 of the glass model.

Mr. Dickson:

692 Q. You have a number of faults shown on the north dipping vein on that section, which has caused displacements of the vein to some extent.

A. Yes.
Q. As you travel down that northerly dip as we call it, in the direction of the displacements the same on each fault, or in some places, take what I will call the northerly side of the fault, with reference to the southerly side of the fault, and in either case the southerly side of the fault raises relatively to the northerly side of the fault,—do you understand the question?
A. Yes. I will have to answer that in this way: That the actual movement of the blocks of rock may have been in each instance in the same direction, and on the left of each of the faults, but that the vein at that point is so extremely irregular in small details that the effect of opposite directions may have been produced.
Q. Well, has it that appearance now of opposite directions of throw?
A. Yes.
Q. Is that the appearance?
A. Yes.
Q. Have you depicted upon this "Finch-7" accurately an actual measurement of the extent of displacement along each of these planes of faulting?
A. As near as could be determined on each of them and in some instances with some accuracy. The one that shows the greatest displacement gives an excellent opportunity to measure the amount of displacement along the dip of the fault.
Q. That is shown accurately on this sketch?
A. Yes.
Q. The others are approximate.
A. The others are determined largely by the amount of throw of the ore streak.
Q. Take the most northerly,——
A. The most easterly?

693 Q. The one next to the most northerly; the second one as we have a summit up that stope. There is some displacement of the vein shown on all that plane or fault.

A. Yes.

Q. What is the appearance there? that the southerly side of the fault has gone up into the northerly side of the fault, or the reverse?

A. Do you mean northerly and southerly in that section, or easterly and westerly? The direction of the section here is north and south, and the direction of those faults would be east and west.

Q. Yes. I stand corrected. You are correct.

A. The faults do not cut squarely across the section.

Q. As we start from the most easterly fault upon this section and come to the next one, what is that?

A. Judge, I believe I have confused you. That is starting at the north.

Q. I was right then in the first instance?

A. Yes, but the strike of the fault is northerly and southerly.

Q. Well, I do not care about the strikes, I understand them.

A. The second one shows evidence of being a normal or gravity fault one which the hanging wall side of the fault dragged downward.

Q. The opposite side went upward or the other?

A. Yes.

Q. You spoke also in direct if not in cross, of places where you found float, beneath this fraction dacite breccia, which you took to be the result of erosion upon the old surface, will you point out the places as definiteoy as you can, where you found what you believed to be that condition?

A. In a general way——

Q. Now, I don't want it general. I want it as specific as
694 possible so that we may have it examined if we desire to examine that particular spot.

Q. That would be practically reitteration of the points where the terminal edge is found. In the 600 it is well exposed, but mixed with the dacite breccia with the down flowing fragments of the vein.

Q. If you will be good enough to give each place so that it will be in the record, so that we can show it to our witnesses.

Mr. Lindley: Did you say float or flow?

Mr. Dickson: Float.

A. Seen for the last fifty feet of the extreme west end of the 600 level; it is seen to a certain extent in the west end of the 500 level, but not exposed so clearly as it is in the 600 it is shown very clearly in the 300 level of the West End, in the region where the yellow represents the rocks——

Q. Is in contact?

A. Is in contact with the apex of the vein. There are boulders of quartz to be found in this vicinity for a considerable distance away from the vein.

Mr. Lindley: This vicinity is what?

A. The 300 level of the West End westerly beyond the apex of the vein,—and these boulders of quartz having been dislodged from higher points along the apex; another point in the 166 level fragments of float are very clearly shown.

Mr. Dickson:

Q. Whereabout?

A. 166 level.

Q. At what particular point?

A. In the vicinity of the top of the raise, which connects upward with that small level. The same may be said of 172 level, the exposure being of the same character. It is also shown in the stope which has been referred — at the mouth of the cross cut leading from the West End to the Ohio.

695 Q. Near what station?

A. In the back of the stope. There are not any station- up in the back of the stope, but this extreme southwesterly extremity of the stope and the little projection which is shown in the extreme southwest corner. Then down in the *corss* cut marked 10-A the same condition is shown to the west.

696 Q. Any other places?

A. There are two or three other places in which the development does not show it so well as in the ones I have mentioned, but does show it, nevertheless. For instance, in the cross cut running out from the 1186 level of the MacNamara, it is shown as yellow on the model.

Q. Any number in it on the model?

A. Pardon me?

Q. Any number to that piece of work on the model?

A. Marked 273 X. The point of meeting of the end of the vein of the Fraction breccia at that point is confised somewhat by a fault which slices practically along the end of the vein. So that is not as good an exposure of what we are discussing as the other points are.

Q. Now the entire of the trachyte throughout the mine which underlies and is in contact with the cap rock was an eroded surface when that cap rock flowed out, as you *you* contend or believe?

A. I will have to hear that question.

Q. The trachyte is the rock which immediately underlies the cap rock?

A. The other cap rock, yes.

Q. Well, you do not find this fraction dacite breccia anywhere except this westerly extremity, then, am I right in that?

A. In this westerly region, this fraction dacite breccia overlies the other cap rock, the midway as well as the Mizpah trachyte.

Q. The cap rock overlying—over the surface generally overlying your fraction dacite breccia and other cap or flow before

697 that?

A. Oh, yes, there are later rocks, as Brougher, but those are considerable distance away from the area of these maps and exhibits.

Q. From where?

A. They are — considerable distance away from the area of these exhibits. The fraction dacite breccia, in other words, is a cap rock which caps a cap rock, as well as the exposure of the vein in the underlying rocks.

Q. What is the rock next above the trachyte?

A. The trachyte?

Q. So far as developed in these workings, what is the cap rock next above that, what do you call that?

A. Over the greater part of the area of the mine, it is Midway andesite.

Q. Midway andesite?

A. But as we come towards the west, Midway andesite, as I have shown upon the little block model, the Midway andesite comes to an edge, and has been eroded away, and the fraction breccia overlies that edge and passing down from the Midway andesite, overlies the Mizpah trachyte, the lode porphyry, after it passes the outcrop of the vein.

Q. Well now, before your Midway andesite, is it?

A. That is the earlier cap rock.

Q. Yes, that is the earlier cap rock. It is your opinion that the underlying trachyte, at its upper surface, had been exposed to the surface action for a long time before that Midway andesite flowed over it?

A. Yes, I think so.

Q. A long time, speaking geologically?

698 A. I don't know how long the time was.

Q. Of course you do not, but you think a long time, even in a geological sense of time?

A. It certainly was a considerable period of time.

Q. You have observed a number of raises going up in the trachyte to a contact, and in some places up into what you call the Midway andesite?

A. Yes sir.

Q. Have you found anywhere evidences of debris there at the plane of contact?

A. Not in all cases because——

Q. In any case?

A. Yes.

Q. Where?

A. As I remember it, up in raise B.

Q. In raise B?

A. Yes. The base of the Midway is a very loose material at that point. Now, I wish to explain that answer further: that is one of the few places which we find around the mine workings in which the Midway has not bee- brought down into contact with the trachyte by faulting movement, creating an artificial contact, and not a contact of a rock which overflowed what was once the surface of the earth. So where it is a fault contact, the loose material which would have been found, would be found if it had been the land surface, does not appear.

Q. Point to any other place where you find the debris along the plane of the contact between your Midway andesite and the underlying trachyte?

A. The 400 level of the Jim Butler is another case where the Midway is found lying upon the trachyte, practically in its
699 natural position. There, the bottom of the Midway is a considerable band or mass of loose material.

Q. Fix that place definitely?
A. That is, of course, an older cap rock contact.
Q. I understand.
A. And there has been considerable cementation and filling up of that loose material since the contact was formed.
Q. I want the place definitely fixed where you find the debris.
A. In a general way——
Q. I do not want it in a general way.
A. It would not be a point because it covers a considerable area.
Q. Just give us the place, then, so we can go to it and examine it?
A. You will find it a short distance above the 400 level of the Jim Butler in a raise which has no name here, but is exactly on the south side line of the West End.

Mr. Lindley:

(Q.) Is that the 420 raise?
A. I have never had occasion to use the number of it before. It does not appear on either the model or the map. I will mark it 420 raise for reference.

Mr. Siebert: 420 Jim Butler.
Mr. Dickson: All right. I have no objection to Mr. Siebert, or any other witness fixing the place.

Mr. Lindley:

(Q.) Is that marked on the Defendant'- model?
A. No, it is not. It is the raise which is shown a very short distance above the Jim Butler 400 cross cut; that contact shows soft, loose material, the contact.

700 Mr. Lindley: It is not numbered on your model, either, Judge Dickson. He can point out the raise on your model, if you would like to have that.
Mr. Dickson: Well, you can point it out on our model.

A. It is in the same position as this and marked green on your model instead of purple; the contact being the same in both cases, the same position. Southerly from that raise on the Jim Butler 400, some 50 feet, is a cross cut extending towards the north east.

Mr. Dickson:

(Q.) There must be a station number there, I take it, at that junction?
A. It is not numbered, but it is a point—the mouth of the cross cut is at a point about 50 feet south easterly from the 420 raise.
Q. And it is at the mouth of that cross cut?
A. Yes.
Q. Where we find the——
A. No, right near it.
Q. How near it?
A. The contact is practically in the roof of that cross cut, and as you step only for a short distance towards the north east, toward the

cross cut I have mentioned, which divides into two prongs, shown purple on the plan map. Only a short distance from the mouth of that cross cut, the Midway andesite comes into the roof and follows flatly along the roof for a distance, and then practically level with the cross cut toward the north east. That is a natural contact, not brought into position by fault.

Q. There you find what you take to be debris as the result of the surface erosion?

701 A. Yes, debris much compressed on account of its age, and on account of the weight of the rocks above it, but, nevertheless, soft, disintegrated material as compared with the massive rocks which overlie it.

Q. Where else?

A. There are very few other developments of the contact where it has not been affected by faulting.

Q. Do you find it anywhere else than the two places you have mentioned, then?

A. No. I will state that we find the contact at other places where it is not faulted, but in some of these cases it is a very obscure contact; the contact has been obliterated by subsequent chemical action.

Q. About where, as you travel westerly, do you have a change from the Midway andesite to the fraction dacite breccia?

A. Well, as you travel westward, you find the transition from one rock to the other along a very irregular line.

Q. Well, about where do you have the—if there are two distinct outflows, and a long lapse of time intervening between the two, I suppose there is some line of demarkation that can be fixed with some degree of accuracy?

A. Yes, that is shown in a general way on the yellow surface of the block model.

Q. Now, can you point out on either model, Plaintiff's Exhibit 2, or upon Plaintiff's exhibit 1, where you find that change, Midway andesite to the fraction dacite breccia? Or you can do it on the plan map, exhibit I?

A. Yes.

Q. Well, take that.

702 A. But the question is not an easy one to answer for this reason: That for the entire length of the map east and west we have Fraction dacite breccia. If you go to a certain elevation we find it and it slopes off westward so that we find it a deeper elevation as you go in that direction. It is found in the Fraction No. 2 shaft, and it is found in the McQuillan shaft and it is found in the summit of the raise which is marked on the map overlying Midway andesite, the raise 420. It is found in the Corkhill working shaft of the West End.

Q. Then, are we to understand that what you call fraction dacite breccia, that rock extends over the Midway andesite throughout the working shown upon these maps and models?

A. Throughout an area about like this (indicating), follow such a line.

Q. That won't show anything in the record.

A. All but a small part of the north easterly area of the map; or rather, the north easterly area of the north east corner of the map, and the little block illustrates the—covers about the same area as the map does, and this irregular edge shows about how far the fraction dacite breccia extends in the area of the map.

Q. Extends easterly?

A. This is where it comes up to the surface extending north easterly; upward on its dip. It is found in a great number of the workings.

Q. Will you give us the number of the sheets in exhibit 3 that have been passed through that section of the country lying
703 between raise 7 A on the east and raise 302 westerly thereof?

A. 3 intervening between those points.

Q. What are their numbers?

A. 5, 6 and 7.

Q. Now, in that area——

A. You will find those numbered here (indicating)

Q. Oh, yes. In that area, lying between raise 7 A on the east and 302 on the west, if there ever was or is now a crest of a fold, it has not been developed, of course? You can see that by looking at the model, it is perfectly clear?

A. It has not been developed continuously clear across between the MacNamara and the West End, but it has been developed sufficiently to be, in my mind, beyond question.

Q. Where is the crest of the fold between raise 7 A and raise 302 developed?

A. The dip of it on the north side——

Q. No, I mean the crest. I mean the crest. It might come very near together, and yet not meet. Where has the crest of the fold been developed, if at all, between those places?

A. Approximately, the crest of the fold is developed at the foot of 372 raise, which is about 125 feet east of 301 raise.

Q. Practically. Has it been develepod actually?

A. I think so.

Q. What?

A. Yes.

Q. Can you point out the model that?

A. That is within a few feet of the actual summit of the anticline.

704 Q. Is the summit of the anticline disclosed there? A few feet might be all important?

A. And it is exposed also, well——

Q. Answer the question. Has the summit of the anticline been exposed at the place you have just referred to?

A. Yes, I think it has.

Q. Well, why do you say within a few feet of the summit?

A. What I mean is that either one side or the other of that working, a few feet, there might be a point that would be slightly higher, the strike——

Q. Well, put it this——

A. No, let me answer the question completely. The strike of the

quartz at that point is such, and the dip of it towards the east is such that it is almost positively the summit of the anticline.

Q. All right. Take section 5, in Exhibit 3, or sheet 5, how is it there where that plane was passed through as to any development of the crest of this fold?

A. It is found on each side, under a thick layer of the Mizpah trachyte which has not been eroded, hence it is not eroded at the actual summit.

Q. That is what I want. If it is not developed, I want you to say it is not developed, there, is it?

A. I did say that.

Q. And where section 7 passes through the crest of the fold is it developed there?

A. Yes, I think it is.

Q. Does not show so on the model, does it?

A. Yes.

Q. Where?

A. 366 raise.

705 Q. Point to the place. I do not know these numbers.

A. It is developed at the summit, in this net work of working around 302, and toward the east.

Q. If my eyes do not deceive me, that raise is easterly of section or sheet 7. I want it right on sheet 7.

A. Yes, right on sheet 7, at the foot or near the foot of 366 raise is the summit of the anticline.

Q. There is no working there indicating that you go from that point northerly and southerly, though?

A. There is not only a working, but a series of workings.

Q. They do not show on the model?

A. Permit me to explain: the vein which to the south west is developed with a north easterly strike is found in a drift or cross cut running to the 372 raise, and in the main cross cut at the 200 level passing from a south west strike to a northerly strike, and back again to a north westerly strike, and the form and position of the summit of the anticline is, in my mind, perfectly developed.

Q. Are all the works in that intervening space, namely between raise 7 A and raise 302, shown on this model.

A. All the workings.

Q. Yes, that are in the mine; are they shown on that model?

A. No, there is one little working that is not shown.

Q. Where?

A. A little raise that connects up through into your 302.

Q. That is east of 302?

A. Yes.

Q. I am speaking between——

A. No, it is right under 302. There is a raise that con-

706 nects up through there that seems to have been left off the model, a short one.

Q. 302 we admit that the crest is there approximately. But between 302, and thence easterly to raise 7A. My question was directed

to that space. Have you told us all you have to say of the disclosure or exposure of the crest of the fold in that area?

A. Yes, it is well exposed in the section 7. I only have this much to add, if it is proper to add it: that in the exposures, say along section 5——

Q. And 6?

A. Well, 6 developes it; crosses about through the end of this drift, so that section 6 will show t-e summit of the anticline about as I now hold my finger, just to the east of raise 372. The raise is shown up there. (Indicating.)

Q. You can see that is a very considerable distance east of Section 6? It must be——

A. No.

Q. That raise on the map upon which the model rests——

A. The raise is west.

Q. West; is about how far west of Section 6?

A. About 35 feet.

Q. I want it on the line of the section?

A. Then the drift extends on and in the floor of the drift the anticline is shown, the summit of the anticline is shown very nearly to section 6, dipping downward.

Q. That part of it is colored green on your model?

A. On this other side it is colored better.

Q. It that color green or any other color on that side?

A. Well, the direction of the dip of the summit is shown better on this side.

707 Q. That line of work to which you point has the green top, sides and bottom, has it not?

A. I said the summit of the anticline is the foot of 372 raise, dips flat towards the eastward in Section 6. And the cap rock or trachyte is full of hanging wall stringers where it is shown green upon this working.

Q. All right. Have you anything else to say?

A. I only have this to say: that if you go into drifts 442, 478, and such drifts lying on the south slope of the anticline in section 5, that you will find a very great thickness of the lode porphyry overlying the vein. It has not been eroded. You go to the MacNamara on the other side you find also the Mizpah trachyte, not eroded. You go eastward into Section 4, and you find the overlying trachyte still intact. That is in explanation of my statement that I believe that the anticline is sufficiently developed so that I can state that it has not been disturbed by erosion.

Q. That is your opinion?

A. That is my opinion, yes sir.

Q. On the section 5, as well as on 6 and 7 that pass through that intervening country, referred to, the arch or crest of the fold is shown as uninterrupted and unbroken as it is on any other section in the model, Exhibit 3? I am not finding any fault with it, but that is the fact, is it not?

A. There is plenty of information near at hand for the representation in Section 5.

Q. Oh, well, answer my question. Read the question to the witness.

708 Some of these questions might be answered, I should think especially a question like that, without any explanation.

A. I did not intend that as an explanation. It is a statement. The representation in section 5 is not a continuous representation of the vein, but is a coarse dotted line.

Q. Any more there than on the other?

A. Yes. I will point them out to you.

Q. I can not see through that model.

A. The heavy, broken red lines representing the summit of the anticline. Of course, it is not exactly developed, but its position is based upon information near at hand.

709 Q. Now, take,—there is one of those which seem to be practically unbroken.

A. Made up altogether of——

Q. Well the one that you are just pointing to now, right at the summit of the fold,—is that unbroken?

A. No, I don't think so, it was not intended to be.

Q. Have you pointed out in your cross examination yesterday all of the places on this westerly terminal edge of the vein which you have referred to where you find oxidation?

A. I don't think that I have overlooked any of them. The oxidation occurs at all of the point- I have pointed out.

Q. Now come to Defendant's model Exhibit-A for a moment. I will call your attention to the most westerly stopeing shown upon this exhibit, on the north dipping vein. Don't you have it there in contact with that what you call the Brougher andesite and what you call the Fraction Dacite breccia?

A. We have the same representation that you have; ours is green on the upper edge. There is more of it shown on this model.

Q. You did not point that out as one of the places where you found the oxidation; did you find the oxidation there?

A. Oh, yes, also where in your model you have the green color.

Q. You did not point that out yesterday as one of the places where you found oxidation?

A. If I did not I will, because the oxidation exists there at the summit of the stope where the green is shown.

Mr. Lindley: That is identified by what number, if it has a number?

A. That is the very same stope that I described as being at the mouth of the cross cut from the West End mine,—the long curving cross cut.

710 Mr. Lindley: All right the long cross cut.

A. Yes, it is the stope here.

Mr. Dickson: I am not speaking of that, that is not shown upon our model at all.

A. Yes, that is the one we were just talking about.

Q. Is that shown on our model?

A. Yes; the prong extends further up on your model than it does on ours.

Q. All right: You overlooked that point yesterday when you were asked to point out all the places of oxidation?

A. I thought I mentioned that and two other places further west in connection with it.

Mr. Dickson: That is all.

Redirect examination.

Mr. Lindley:

Q. To bring out a little more clearly the situation on section-7, I will ask you if you have any notes made by you upon the ground, depicting the exact condition there, and also the relationship to section six?

A. Mr. Dickson: Section-7, we did not make any dispute about it.

Mr. Lindley: The witness mentioned five, six and seven, and this is necessary owing to its close proximity to seven, and it is simply making an explanation which I think is essential at this time.

Q. Did you make a graphic representation of that?

A. I did, yes.

711 Q. Have you that representation?

A. I have.

Q. Will you kindly mark that "Finch-10."

Mr. Dickson: "Finch R. D."—redirect.

Mr. Lindley: Redirect. Mark it "Finch R. D.-1."

A. (Witness marking exhibit.)

Q. And state what it purports to represent and how far from the extreme representation of the anticlinal there, is section six?

A. The map represents the workings on the 300 level the series of workings which were discussed just a few moments ago in connection with section seven and in connection with section six; it will be seen from the red markings upon the drawing which represent quartz, all this extends in solid quartz, where they are continuous with a great series of workings that have been made around section-7, and that the strike as starting from the southwesterly direction turns from a north and south direction, turned northeast; now the blue line shown upon the drawing is the Siebert Fault, and not named upon the drawing, and the prow or summit is a point where a south bend is made towards the eastward in the vicinity of raise 372, already mentioned, which I will mark upon the drawing. At the base of that raise is the solid massive body of quartz dipping towards the eastward, so that from the floor of the drift it is only a very short distance to section Six; and the position of the anticline, as shown in Section Six, is a projection of this very short interval from this very great and thoroughly developed mass of quartz, just to the west of it.

Mr. Dickson: That I understand is on the 300 level, that sketch?

712 A. Yes, it developed the end of the anticline on its strike, shows the relation of the cross section, because the cross sections are numbered at the outer edge of the plan map.

Mr. Lindley:

Q. Mr. Finch, now will you kindly put this block model together?

A. (Witness assembling block model.)

Q. Now, at the time the structure of this model and its surface was explained, did you call attention to the delineations and markings which are on its south side, purporting to show the structural conditions?

A. I did not.

Q. Will you kindly explain to the court the markings on each side and what they represent?

A. The design—the conventional design showing the rock formation around the edge of the uppermost blocks, is the design of the Fraction Dacite Breccia, and there is a green band marking the limit, as shown in this model; F. D. B. at various points is the symbol for the Fraction dacite breccia. When the topmost piece is taken off, all the Fraction dacite breccia is removed from the underlying rocks, and the rocks are represented in the model. It has been explained that the faulting by the Siebert fault has been eliminated in order to reconstruct the surface, which was buried by the Fraction dacite breccia. On the end of the model is shown a suggestion of the effect of the Siebert fault, the Fraction dacite breccia being brought down from its old surface below or to its present position, found in the ground, and the F. D. B. is found on the east end of the model,—over the Midway andesite, which is the older cap rock, that is marked by a cross hatched design and contains in various places the letters M. A. indicating Midway Andesite; the Siebert fault is indicated and named on the model, and underlying the Mid-
713 way Andesite is the lode porphyry marked M. T. for Mizpah trachyte. Underlying the vein on the east end is the glassy trachyte, marked "G. T."

Mr. Lindley: May I at this juncture call for the true specimen, used in the Winchell cross examination,—Winchell "X-6 and X-7" I think.

Mr. Evans: "Winchell X-2" is a glassy trachyte, and "Winchell X-3" is a plain trachyte or Mizpah trachyte.

Mr. Lindley:

Q. Calling your attention to the two specimens marked "Winchell X-2" and "Winchell X-3" will you kindly state what those rocks are?

A. The rock marked "Winchell X-2" is the glassy trachyte, which is shown under the vein at the extreme east end of those various main exhibits. It is a rock of very distinct characteristics; it has a banded structure in that region, a flow structure, which formed at the time when the rock was in a plastic condition. A distinction between the rocks is very easy for anybody to recognize, without any reference to mineralogy, crystallography, or any of those technical features. The Mizpah trachyte is the characteristic porphyry with the mineral scattered in it without the flow structure which shows so distinctly in the other rock,—much different.

Q. Referring to your model representing the line of demarcation between those two rocks, is that a distinct line or an obscure line?

A. It is a distinct line.

Q. Now, proceeding down,—you have explained the geology and geological relations and marks on the different sides,——

A. All except on the west side.

Q. Please explain that?

A. It is of interest to notice that passing from the northeast corner of the model we find the west end rhyolite underlying the
714 vein; that same rock is shown for the entire length of the model as the rock in contact with the Mizpah trachyte, and the vein forms along the contact; then on the northerly side of the model also, to which I am now pointing the Siebert fault is indicated, showing a layer of lode porphyry still remaining in the hanging wall under the fault, and the fault at all points along that north side at some distance away from the vein.

Q. Now, kindly remove the capping to expose the vein. I understand that that closing line shown on the model, formed by the block which you have just removed, is significant only in part of that structure?

A. It is intended only to fill in the corner here, to show the present surface, the essential parts of the model are those which are now on it,—the surface covered by Fraction Breccia, and the vein itself.

Q. Now, with reference to the vein as now exposed, showing the entire red coloring, I will invite your attention to what would be the northwest section of the vein as cut by the Fraction dacite breccia. With reference to the MacNamara stopes concerning which you were questioned by Judge Dickson, those stopes which lie to the extreme west of the MacNamara workings, and which are shown in the plane of the West End cross cut,—does that outline of the vein—how does the outline of the vein, as intersected by the Fraction Dacite Breccia on that model correspond with the outline of the stopes as shown upon the map?

A. Corresponds almost exactly because that is the line upon which the outcrop is based,—a series of points.

Q. Is that not a correct representation of the original edge or outcrop as shown through all the workings of the West End and MacNamara mine?

A. It is,—correct, so far——

[Page 715 of manuscript omitted in original transcript.]

716 Mr. Lindley: I think perhaps Mr. Uren would have more leisure.

Mr. Dickson: Well, Mr. Pierce on our side occupies about the same position on our side as Mr. Uren on your side.

Mr. Lindley: That is all.

Recross-examination.

Mr. Dickson:

Q. "Finch R. D.-1" simply represents the workings on the three hundred level?

A. Yes.

Q. Therefore are not intended and could not show the top or crust of the fold?

A. Yes, they do show it.

Q. Is the top of the fold encountered on the three hundred level?

A. Yes.

Q. Is that the top or the toe?

A. The same thing.

Q. Does the vein extend upward beyond the plane at that point?

A. Yes.

Q. Does this show the summit of the fold?

A. It shows the summit of the fold at the level on this map.

Q. But from that level the vein extends upwards does it not, to a summit?

A. As it extends up to the summit on other levels.

Q. At this level where you have that line marked "toe" does the vein not continue on upward beyond that level?

A. Yes, and downward.

Q. Well, maybe the court understand- that, I am sure I do not.

A. That is the summit of the anticline at that particular
717 horizontal plane.

Q. And yet when you get to the summit marked "toe" you go up the vein, higher up?

A. Yes, certainly. The summit I am referring to is something like this; you keep going up to higher elevations along the summit.

Q. You misunderstand the question. I ask you, directly above what you represent on this "Finch R. D.-1" directly above that does the vein continue upward?

A. Yes, the crest continues upward.

Mr. Lindley:

Q. Is this a cross section?

A. No, that is a plan map.

Q. I do not mean going westerly, but I asked what you called the crest, immediately where you have the "toe" indicated on "Finch R. D.-1,"—does the vein go on vertically above that?

A. No, except as stringers; the solid body of quartz has that form shown in the block model, the same as we have——

Q. The same as you have in the A-raises, in dimension?

A. Yes, somewhat.

Q. How thick are they?

A. I have not noticed the particular thickness.

Q. A half an inch, a quarter of an inch or what?

A. It might be that or more.

Q. It might be that or more, a half or a quarter of an inch?

A. Yes, in indefinite seams.

Q. What do you say that "Winchell X-2" is?
A. That is glassy trachyte.
Q. You heard his testimony?
A. Yes.
Q. And what would you say "Winchell X-3" is?
A. Mizpah trachyte.
Q. Or what we call the trachyte.
A. Yes.
718 Q. Do you know where those specimens came from?
A. No.
Q. You have not been told?
A. I think that I have, but I have forgotten.
Q. Are the stopes shown in the Ohio workings to which you referred, shown also upon the block model, exhibit-4?
A. Not all of them, no. No stopes are shown upon it, but the vein is represented up to these two stopes we were discussing this morning.
Q. Is the extreme westerly stoping which you speak of as shown by these Ohio workings, the vein or anything else shown——
A. As I remember without looking at the exact drawings from which the model was made, the westerly limit of it is about at the cross cut marked 300 West End, here.
Q. You speak of still a third one still west of that, some forty feet or more?
A. Yes; that is at the tip end of this main westerly cross-cut—running to the north.
Q. Not represented on the model?
A. No, not surveyed up,—it is being still driven.
Q. You say that the Fraction vein has a terminal edge. Give me the section that you referred to in direct examination, where you said that you had the Fraction vein in the top of Raise 5-A?
A. No section cuts the top of 5-A; there is some projection of it, it is shown on the model.

Mr. Lindley: Well, I want that section in the model the section that he drew.
Mr. Dickson: The one that he used in direct examination.
The Witness: Section No. 4 I think.
Mr. Lindley: That is identified how?

A. There are two sections one on each side of that raise, but the representation here is not far from the position of the top
719 of 5-A,—the Fraction vein.
Q. Well, I won't take the time now, but I will have you as soon—that is not what I have reference to. Did you make a sketch while you were underground?
A. I did.
Q. Get that sketch then? This is not the picture which I had in mind.
A. (Producing sketch.) Marked "Finch-2" and the B. part of the drawing.

Q. Is that raise to the right hand as we take the sketch, intended to be 5-A raise?

A. Yes, of course very roughly drawn.

Q. Yes. Point out what you intend to represent on this sketch as the Fraction vein?

A. This upper considerable representation in red.

Q. Having a curved effect?

A. Yes, it is very much that form in the ground.

Q. Does that unite with the quartz in the 5-A raise, as you follow up that raise?

A. There is a very considerable interval,——

Q. Does it connect with quartz in the north dipping vein, what we call the north dipping vein, as shown in that raise?

A. Not, according to my observation; I have some exact distances from which I might give you,——

Q. Does not the quartz which you represent there as being the Fraction vein, unite with the quartz in the south dipping vein, as shown in that raise 5-a?

A. No, sir, it does not. There is a little drag quartz.

Mr. Downer: You said a north dipping vein, Judge Dickson, you mean to say south dipping?

Mr. Dickson: I mean to say south.

A. No, it does not permit me to make a distinction. There
720 are fragments ground up quartz in the gouge of the Siebert Fault, come from we don't know where; the only possible connection of quartz that could be made would be along that gouge. There is an interval as I remember it,—I will give you the exact distance between that Fraction vein, and the next streak of quartz in place; then the statement will be definite. 97 feet measured along the raise to the Fraction vein.

Q. 97 feet from what?

A. From the bottom of it. From the bottom of the raise, 72 feet going down the raise—as you go to a point 72 feet from the bottom of it before you find the next quartz in place.

Q. But you have drag quartz in between?

A. Not any between, but along the gouge of the fault.

Q. You have drag quartz connecting the quartz in place in the north dipping vein, with what you call the Fraction vein?

A. They don't connect. The drag quartz was made at a period ages after the vein, and the stringers in place were formed.

Q. I am not asking for any explanation; I want the facts. Is there from the quartz in place in the north dipping vein up to the place where you have represented there the Fraction vein curving over, have we drag quartz, or any quartz of any kind, any place between?

A. Yes, the drag quartz can be found forming a part of the gouge.

Q. And that drag quartz you say, as I remember you in cross-examination before, they have come from some little stringers in the hanging country?

A. I don't think that there is any doubt but what it did.

Q. Or might have come from the Fraction vein?

721 A. Some of it undoubtedly did.

Q. How much of this block model—of the geology, by that I mean to include the Siebert fault, is represented from actual disclosures made by workings, and how much of it as a matter of inference or deduction by you from actual facts. We will take the easterly end of the block model; put on the other part of it there.

A. (Witness does so.)

Mr. Lindley: Did not you want him to put on the top, Judge.

Mr. Dickson: Yes, he has put it on.

Mr. Lindley: No, that is not the top.

The Witness: Do you want the other piece.

Mr. Dickson: Yes, you may put that on too. Now let me look at that east end. To what extent is the Siebert fault as shown on that surface or end of the model placed there from actual developments, and how much as a matter of deduction?

A. Its position and the form of it has very little conjecture in it. In this particular end of the model the actual points of development are only few, but extend out somewhat from the glass model. But very near the end of the model the Siebert Fault and its position, the amount of throw, all its features, is well shown.

Q. How far away from the east end of the block model?

A. Less than a hundred feet. In other words less than an inch on this model.

Q. Now this part of the model that I am now lifting off, is midway andesite, is it?

A. No that is fraction breccia.

Q. This is the fraction breccia.

A. Yes.

722 Q. The whole of it?

A. Yes, the whole of it.

Q. So that overlying—withdraw that—this M. A. here below that, is meant to indicate Midway Andesite?

A. Yes, the lower cap rock.

Q. And the M. T. below that is intended to represent what?

A. Mizpah trachyte.

Q. What we speak of as trachyte?

A. Yes.

Q. The same thing the same rock. I think that is all. One moment: Will you come to Plaintiff's exhibit One and indicate thereon the westerly extremity in full of the northerly and southerly course of the block model?

A. I should have. To do that exactly I should have to have the drawing from which the model was made. I can bring that in later and will be very glad to do so.

Q. Well, I will ask you to do that and also at the eastern extremity.

A. Yes.

Mr. Dickson: That is all.

The Court: You do make a distinction between Brougher Mountain dacite and the Fraction Dacite breccia, do you not?

A. Yes, I believe that they are certainly two different rock, but in the testimony in the case the terms have been used referring to the same body of rock in the mine.

The Court: That is all.

Mr. Dickson: I understand from Mr. Lindley, that your Honor has announced that you will go underground to visit this one place, with an expert on either side shortly after two o'clock.

Mr. Lindley: Well, shortly after the court adjourns.

Mr. Dickson: What time, your Honor?

723 The Court: Parctically any time that you gentlemen select. I have to leave for Goldfield at three thirty.

Mr. Lindley: Will your Honor fix the time?

The Court: Two o'clock.

Testimony of J. M. Fox, who being called and duly sworn as a witness on behalf of the Plaintiff, testified as follows, to wit.

Direct examination.

Mr. Lindley:

Q. Mr. Fox where do you reside?

A. In Tonopah.

Q. What is your occupation?

A. Mining engineer.

Q. Where are you at present employed?

A. At the Jim Butler.

Q. In your experience as a mining engineer have you had occasion to sample properties, sample mines?

A. Yes, sir.

Q. Have you made—taken any samples in the workings of the Jim Butler, the West End or MacNamara mines particularly, in rauses 2-A; 4-A; 5-A; 7-A, 200-A—200A, I understand is your A is that correct?

Mr. Alling: Yes.

Mr. Lindley: 302, 537, 569, 571, 573, 488 and 494: do you know where those raises are in the mine?

A. Yes, sir.

Q. Did you sample each one of those raises?

A. I did.

Q. I will ask you to state the manner in which those raises were sampled, presenting for your consideration a series of sheets

724 bound together and marked "Plaintiff's Exhibit No. 5." Let me mark this. I will ask you to state—I present here some bound sheets marked, "Plaintiff's exhibit No. 5," consisting of sheets numbered respectively from one to six.

Mr. Dickson: Each one is marked is it, Exhibit-5?

Mr. Lindley: The entire group is marked Exhibit-5 with the

supplemental 1, 2, 3, 4, 5 & 6 within in other words they should have been marked by letters but through a mistake they were marked by numbers, but this will be referred to as sheet No. 1 in exhibit-5. And state what those sheet- represent? Each one, what they represent?

A. Each one represents a series of cut samples taken in raise 569, intermediate 569, raise 488 and raise 537. The sheet shown a vertical section through these workings, and this here indicates the position in which the cuts were taken.

Q. Were these cuts taken at regular intervals?

A. In the majority of cases, yes.

Q. What intervals. State the manner in which that sampling was made through the raise? Was it made on the top, bottom or sides?

A. On the sides.

Q. On both sides?

A. On both sides. The series was not confined to either the east or the west side, samples being taken where——

Mr. Dickson: Is that true in the case of every sample they were taken from both sides?

A. No, sir. We alternated, there was no regularity.

Mr. Lindley: State the method you prusued with r-ference to the choice of sides where you only took on one side.

725 In taking the series along one side the side was determined by the exposure, in this particular case of quartz. The quartz was followed as closely as possible in all cases.

Q. In other words did you make any attempt to sample the best exposure at the point where the sample was taken?

A. Where there was definition to the foot *or* the hanging wall quartz, the sample was taken within those limits, at that interval. The interval of sampling though is not regulated to fit the exposure of the quartz.

Q. How much of a sample was take- at each point?

A. The weight.

Q. Well, across the side of the raise?

A. Well, the width varied from one to six or seven feet.

Q. Did you take samples of the entire extent from top to bottom?

A. Not *is* all cases.

Q. What was the general rule?

A. I followed the rule of taking the quartz where it was exposed.

Q. Taking the quartz where it was exposed?

A. Yes.

Q. On this sheet one of Exhibit five you have delineated—what did you do with those samples? How were those samples taken and what did you do with them, after you took them down?

A. The samples were taken with a hammer and moil put into a box, sacked, tagged, and sent to an assay office.

Q. Who was the assayer?

A. Mr. Calhoun of the Belmont.

Q. Did he subsequently make the assays?

—. —.

A. And did he report the results to you?

A. Yes.

Mr. Lindley: We will subsequently call the assayer.

Mr. Dickson: It is not necessary. Get his certificate that is all.

726 Mr. Lindley: You have a copy of the certificate there.

Mr. Dickson: I have no doubt but they are correct.

Mr. Lindley: I will ask you—I am handing you now a series of what purport to be assay certificates. "Plaintiff's Exhibit-6."

The Court: Before you go on may I ask one question?

Mr. Lindley: Yes, sir.

The Court:

Q. What is the meaning of the double pointed arrows, Mr. Fox?

A. That indicated the section of the working over which the sample was taken. For example, this would indicate that the sample had been taken from approximately this point to this, (indicating) a straight cut down the side of the raise.

Mr. Lindley:

Q. This Plaintiff's Exhibit-6, will you state what that purports to be? From whom you received it?

A. This is a list of the returns on the cut samples, taken by me, and the assays of which were made by C. A. Calhoun.

Q. Who is Mr. Calhoun?

A. Mr. Calhoun is the assayer at the Belmont mine. These sheets show the numbers of my samples, ounces gold, value per ton, ounces of silver, value per ton, and total value.

Q. What figure did you attach as the basis of valuing your silver?

A. Fifty cents.

Q. And gold?

A. Twenty dollars.

Q. Twenty dollars an ounce.

A. Yes, sir.

Q. State upon receipt of that certificate what you did to those assays, as to the tabulation of them on the sheets one to six, Plaintiff's Exhibit-5.

A. After receiving the returns from the assayer, each sample was platted as accurately as possible on these sections.

[Copy shows omission—disconnected.—Pr.]

727 opposite each point taken is given in the symbol outlined at the top of each the number of the sample, ounces of gold, ounces of silver, and total value, and below the line the width of the sample.

Mr. Dickson:

Q. Below it what?

A. The width of the sample.

Mr. Lindley:

Q. Then I understand that the first column to the left hand indicates the gold content?

A. Yes, sir.

Q. The next in order, the middle one of that series of figures is the silver content?

A. Yes.

Q. And the right is the figures in dollars and cents of the value per ton of the entire sample?

A. Yes.

Q. The number of the sample within the circle.

A. This indicates gold ounces, silver ounces, dollars per ton.

Mr. Dickson: I do not think that that is on my copy.

The Witness: Some of those prints are indistinct.

Mr. Lindley: They are all on there, Judge, gold, silver, dollars per ton (indicating).

Mr. Dickson: I see, I just wanted to understand it.

Mr. Lindley:

Q. That is the result of the assay in what raises?

A. Throughout my work?

Q. On sheet one?

A. Raises 569, 488 and 537. They lie on the plane of the same section approximately. They were placed in the same plane for clearness sake.

Q. Now as to sheet two of Plaintiff's exhibit-5, what does that represent?

The Court: Before you leave that Judge Lindley, what do you mean by the width of the sample?

728 A. I should say length, length would probably be more accurate. That is the actual length of the cut taken.

Mr. Lindley:

Q. Calling your attention now to sheet two of Plaintiff's exhibit-5, will you explain what that is and what method was pursued in regard to that?

A. The same method was pursued in regard to section two, which is an assay section of raise 571.

Mr. Dickson:

Q. Is that the same number on our model, does anybody know?

Mr. Lindley: I think it is.

Mr. Dickson: Well, point to your model and I can see.

Mr. Lindley: Are you familiar with this model. Point that out, Mr. Fox.

Mr. Dickson: Where is 571.

A. 671 (indicating.)

Mr. Dickson: That is correct. It is the same I guess.

Mr. Lindley: Proceed Mr. Fox. Sheet three is an assay section of raise 533, samples being taken in the same manner as 569, 571 and shown the samme way.

Q. Assayed as before by the same assayer?
A. Yes sir.
Q. And the certificate reported to you?
A. Yes, sir.
Q. And tabulated upon that sheet as you have explained with reference to sheet one?
A. Just the same.
Q. Just the same. The arrows indicating the same?
A. The arrows indicating the same—sections taken.
Q. And the width of the section, the value of the gold and silver and the total?
A. Yes.
Q. Are there any legends or marks or indication upon these sections that are required to be explained, other than those that you have stated?

729 A. Only this: In places where I have, in one section of the development work where I have taken two samples I have indicated by foot wall or hanging wall. This would indicate that this value of 3.50 applied to this section here, the hanging wall section. This one would indicate the value applied to this portion here, the 2.20. That occurs in several instances in each case both assays have been placed opposite the two cuts.

Q. Instead of taking an average you have given a separate valuation to each?
A. Yes.
Q. Separate on both sides?
A. No where I have taken one sample above another foot and hanging.
Q. Not from one side to the other?
A. Not from one side to the other.
Q. The foot and the hanging?
A. Foot and hanging.
Q. Now this was No. 3 of Plaintiff's exhibit 5, as you have explained is the assay plan of raise 573?
A. Yes.
Q. Sheet No. 4?
A. Sheet No. 4 is an assay section of raises 494, and 7-A. The under portion of this foot wall.

Mr. Dickson:

Q. How is 7-A indicated on that sheet?
A. I neglected to put the number on it.

Mr. Lindley: It shows here 7-A.

Mr. Dickson: Which is 494?
A. 494 is this section here (indicating).
Q. 7-A is from there up?
A. From there up.

Mr. Lindley: Shall we mark that judge.

Mr. Dickson: I think that he had better. Mark the 7-A part and then we will know.

Mr. Lindley: Mark the 7-A there.

(Witness does so.)

Mr. Lindley: Now you have explained all of the data that appears upon that, that requires explanation, that is the sheet 4 of
730 Plaintiff's exhibit No. 5?

A. With this one exception: In these two vertical raises, samples were taken in this direction, horizontal cuts across the south vein of each raise at this point.

Q. I suggest that you identify these two raises by numbers in the top of them, or in that place there. Those raises starting out from raise 494 are how numbered on the map?

A. I don't know. I will have to ask for information. In my work I called them A and B.

Mr. Lindley: They haven't got any number?

Mr. Siebert: No sir.

Mr. Lindley: Mark them A and B then. The lower one A and the upper one B.

Q. There are two raises extending up from the hanging wall of the 494 raise, now the arrow marks there indicates the place where the sample was taken?

A. Yes.

Q. And your line extended out indicates the valuation, the values?

A. Yes. Tying it into this section.

Q. Now is there any further explanation with reference to that sheet four?

A. No, I think not.

Q. I call your attention to sheet five, Plaintiff's Exhibit 5, and ask you what that purports to be?

A. Sheet five contains assay sections of raise 200-A, raise 302 and a raise whose name I do not know, but can locate.

Mr. Dickson: 200-A?

Mr. Lindley: That is your A, Judge.

Mr. Dickson: Well, I wanted the record to show that.

Mr. Lindley: Yes. West end of A.

Q. And this raise, this other raise starts from what level?

A. It starts from the 400 above plug 1413.

Q. Can you locate it on the model. Please locate it on
731 the model or on the plan, Plaintiff's exhibit 1.

A. This is the raise here (indicating).

Q. Identify that by the numbers.

A. 461.

Q. That would be raise 461.

Mr. Dickson: It is the first raise west of the McQuillan shaft.

Mr. Lindley: Yes.

Mr. Dickson: Is it?
A. Yes, sir, 461.

Mr. Lindley: Is that the first raise west of the McQuillan shaft?
A. That is the raise, yes; 461 is the raise.
Q. Have you finished with your explanation of sheet 5, Mr. Fox?
A. Yes.
Q. The sampling in all of these instances was taken in the same way?
A. Yes.
Q. Identified the same way?
A. Yes.
Q. Delivered to the same assayer?
A. Yes.
Q. Whose certificate you were furnished with?
A. Yes.
Q. And the result tabulated as in the previous cases?
A. Yes.
Q. Calling your attention now to sheet six of Plaintiff's Exhibit 5, I will ask you to explain what that purports to be?
A. Six, shows assay sections of raises 2-A, 4-A and 5-A.
Q. Those cross sections—where did you obtain these cross sections?
A. Of these three raises I detailed them myself, starting from known points, and making the detail myself for these. There are vertical sections looking north west.
Q. Well, those sheet-, with reference to those raises you have tabulated upon those sheet-, that shows the result of the assay
732 as handed you by the assayer?
A. Yes, sir.
Q. And the method of sampling: Was it the same as in the other cases?
A. The same in all cases.
Q. And the assays are tabulated the same, and in so far as sheet six of Plaintiff's exhibit 5 is concerned, there are no legends upon there other than those which you have already explained. If there are please explain to the court.
A. No, sir.
Q. The arrows indicate the same on this sheet as on the others?
A. Yes.
Q. And the other the same system of tabulation and notation of the results of the assays as followed in all sheets?
A. The same.
Q. That is correct is it?
A. Yes.

Mr. Lindley: Now, Judge Dickson, I offer this in evidence. Do you want me to bring the assayer?
Mr. Dickson: No I do not think that it is necessary I will consult with my associates, and if they think that it is necessary I will inform you.
Mr. Lindley: I simply want to avoid the necessity of bringing him into the court room.

Mr. Dickson: Well, I will let you know before the court convenes again. I will let you know this afternoon.

Mr. Lindley: All right. Cross examine.

733 Cross-examination.

Mr. Dickson:

Q. You took your samples of each of the raises and along each line of the workings that you did sample at arbitrary intervals of six feet?

A. Usually.

Q. Well, did you depart from that?

A. Only in a few cases.

Q. You were not seeking I take it in your sampling to get the best material that could be found, from point to point as you went up any of the raises?

A. I endeavored to give it as fair a cut as possible.

Q. Did you, while you were taking your samples at arbitrary intervals of six feet, did you in any cases include in your sample anything that you regarded as vein material, that was not in quartz?

A. That was not in quartz? I do not understand the question.

Q. Did you include anything in your samples thus taken arbitrarily taken, except quartz, or what you recognized as quartz?

A. Yes, I did.

Q. Did you do that very often?

A. Yes.

Q. Did you do that generally, take material that was not quartz and include that in your sample?

A. No, sir.

Q. What?

A. No, sir.

Q. Then perhaps you misunderstood me. Did you in any cases include in your sample material that you did not recognize as quartz but believed to be vein material, vein filling?

A. Where there was quartz exposed and I had an opportunity to sample it, the quartz alone was taken, but at certain of the sections in these raises and intermediates, there were stretches where
734 no quartz was in evidence, but we did it here at a six foot interval, sampling the material whether it was quartz or not.

Q. So that some of your samples would be none of it quartz?

A. Yes.

Q. Many of those?

A. Yes, quite a number.

Q. I do not suppose you could point out which of those were so taken? On the A sheet?

Mr. Lindley: Maybe he could.

Mr. Dickson: Well if he can.

Mr. Lindley: Try it. Perhaps he could.

Mr. Dickson: Can you specify the numbers, I do not want to take up too much time on it—which are taken wholly from material which you regarded as vein matter, but no part of which is quartz.

A. I did not understand the question that way in regard to determining it was vein material, yet not quartz.

Mr. Dickson: Vein filling.

A. I did not care to make that statement. I probably misunderstood you. What I endeavored to state was, that where quartz was lacking I still continued to sample *as* a six foot interval.

Q. And at such places, why, you would not have any quartz in your sample?

A. No quartz.

Q. That is what I mean. Calling your attention to a few numbers on sheet one, Plaintiff's Exhibit-5: Number—it is very indi-tinct, what is it, Mr. Fox 248?

A. They are poor prints; 248.

Q. The widch there samples was 6.8 feet.

A. 6.8 feet yes.

Q. Do you remember whether that was quartz or whether it was part of it quartz?

735 A. I could not say without consulting my notes, at that particular point,

Q. Do you know where this sample was taken whether it was taken on the side of the raise or bottom?

A. Yes, sir, it was taken down the side.

Q. Both sides or one side?

A. One side.

Q. And from top to bottom?

A. As indicated *in* the arrow. From approximately the hanging wall of the intermediate to the foot.

Q. Where you have these double arrows, let me understand a little more clearly, what are they intended to indicate?

A. At this point here——

Q. The same places—some places you have double arrows, and some places a single arrow.

A. Yes, at this point I took two samples, two cuts.

Q. One the same side?

A. On the same side. One extending from a point we will say there to there (indicating) with a width of nine tenths of a foot. That is a hanging wall sample. What I call the hanging wall sample. I continued down as a separate sample from the lower end of the first one to the foot wall, calling that the foot wall sample with a width of 2.8 feet.

Q. I see a number of the samples on sheet two which purports to be samples taken at raise 571. You have an indicated width as high in some instances as nine feet?

A. Not nine.

Q. No, I am mistaken about that.

Mr. Lindley: You were looking at it upside down.

Mr. Dickson: Well, six feet?

A. Yes, sir.

Q. Was that taken from top to bottom along the side of the raise?

A. What was the number of that?

Q. No. 272.

A. 272 that was taken down the side of the raise.

736 Q. From top to bottom?

A. From within a foot of the hanging wall to the foot.

Q. Do you remembee whether any of that sample was quartz, or just the material di-closed down the sides of the raise?

A. Some of that material was quartz.

Q. And how much of it, what proportion of it?

A. I could not say, unless I looked at my notes.

Mr. Dickson: I think that is all.

Mr. Lindley: That is all. One moment.

Redirect examination.

Mr. Lindley:

Q. I will ask you whether this method of sampling is the customary method in sampling a mine?

A. Yes, sir.

Q. The ordinary method of determining the values?

A. Yes, sir.

Recross-examination.

Mr. Dickson:

Q. The ordinary method when you want to ascertain the commercial value of the mine?

A. In general, yes.

Q. When you are seeking to ascertain the commercial value, that is the ordinary method?

A. Yes, sir.

Q. Not to show a vein tracing, that would not be the ordinary method would it, apart from any consideration of commercial value?

Mr. Lindley: Well, that is a question, of course, of opinion.

737 Mr. Dickson: Well if you were endeavoring to establish a vein tracing of the continuity of the vein from point to point, regardless of commercial values, would the method that you pursued be the correct one, in your judgment?

A. I think so, yes.

Q. Would it be the ordinary one according to your experience if you simply wanted to determine whether there was a continuity of the vein, regardless of commercial value?

A. Yes, I think so.

Mr. Dickson: That is all.

Mr. Lindley: That is all, Mr. Fox. I suppose, if your Honor please, we will adjourn until tomorrow morning at ten o'clock as usual.

The Court: The case is continued until tomorrow morning at ten o'clock.

738 Morning Session, Eighth Day.

Thursday, December 17th, 1914—ten o'clock a. m.

The Court: The Jim Butler Tonopah Mining Company, vs. the West End Consolidated Mining Company.

Mr. Lindley: Mr. Dickson, when Mr. Finch was on the stand, you asked him to locate the position of that block model.

Mr. Dickson: Yes.

Mr. Lindley: Do you think that he had better take the stand first.

Mr. Dickson: No, I think not. The model is fixed by the fact that the West End claim is located upon it. That is all that is necessary.

Mr. Lindley: Very well.

Testimony of FRED J. SIEBERT, who being called and duly sworn as a witness on behalf of the Plaintiff, testified as follows, to wit.

Direct examination.

Mr. Lindley:

Q. Mr. Siebert, what is your full name?

A. Fred J. Siebert.

Q. Where do you reside?

A. Tonopah, at present.

739 Q. And prior to residing at Tonopah?

A. Reno.

Q. In this state?

A. Yes.

Q. What is your profession?

A. Mining.

Q. How long have you been engaged in that occupation?

A. A little over sixteen years.

Q. Before starting out in life did you have any preliminary collegiate training?

A. I did, but not in mining, except that at college I studied chemistry, physics, geology, mathematics and things of that sort which pertain to the profession of mining engineer.

Q. How long were you at college?

A. About three years.

Q. What college?

A. Ohio State University.

Q. How long have you been engaged in the active practice of the mining business,—in contact with it?

A. Every since I came to Nevada, and I arrived in Nevada the first day of December, 1898.

Q. Where have you held down that business and in what capacity?

A. Arriving in Austin, at the time that I have mentioned, I prospected for a few months, in connection with Governor Oddie, and after that, I think in February 1899, I took a lease on the Gold Park mine with three other partners, and we worked this lease for about six months.

Q. Where was this property situated?

A. About forty miles southwest of Austin; while we were leasing on this property I did the assaying, which I had learned in Austin under Professor Gayheart, and ran the mill on one shift, besides doing such other things around the property as were necessary,—some surveying, and also helping in the mine, when I had nothing else to do. After this lease terminated I returned to Austin, and in connection with Governor Oddie we formed a small develop-
740 ment company known as "The Pacific Mining & Development company" and with some little backing that we had we started to prospect and look for properties. We were unsuccessful in finding anything satisfactory, and about February, 1900, after we were both out of funds, I went to Bingham, Utah, where I succeeded in getting employment with the Dalton & Lark Mining Company.

Q. In what capacity?

A. My first job at the Dalton & Lark, was driving a mule team hauling coal to the mine on the tramway. I then succeeded in getting underground as a trammer, and was successively and within a few months, pumpman, and then shift boss, and had been appointed Superintendent, but about this time the mine closed down; that was in the fall of 1900. I went from there to Salt Lake City, and did some examination work for Mr. W. A. Cartan.

Q. Examination of mine.

A. Yes. It was only for two or three months. I think that it was in December 1900 that I went to Park City, Utah, and took employment in the Silver King Mill, under the promise from J. B. Fleming the Engineer of the property that I would be made Foreman of Construction, as soon as it was started; I remained in the mill for about two months, and then was appointed Foreman of Construction on work covering the construction of tramway of the Silver King Company, connecting the mine with the Railway, also the construction of a sampling mill, the terminals of the tramway, and a lot of incidental construction work.

741 I finished with this in September, 1901, and then was employed at the Quincy Mine, installing first an electric lighting system, and some other improvements around the mines.

In October, I think it was the latter part of October or early part of November, I was employed by Judge Dickson and his associates to come to Tonopah as the Superintendent of the Tonopah Salt Lake Mining Company, and also of a claim which they owned personally called the Lucky Jim, which is now the principal claim of the Montana Tonopah Company.

In December, 1901, I was offered a position as Superintendent and engineer for the Tonopah Mining Company, which I accepted, taking effect the 1st of January, 1903.

The Court:

(Q.) 1902?

A. 1902. I was then Superintendent and engineer for the Tonopah Mining Company from that time on until my resignation was accepted in May, either April or May, I forget which, 1904. I also

had charge of the Tonopah Belmont Development Company, the Tonopah Fraction Mining Company, the Gold Hill Mining Company; both of the last two named companies are now a part of the Jim Butler Mining Company.

A. I forget just when my employment started with the Tonopah Belmont, but it started with the first work that they did after forming the Company. My employment with the Tonopah Fraction Company started some time toward the end of my stay in Tonopah, and after Mr. Curtis had resigned as manager.

Mr. Lindley:

(Q.) Now, just briefly follow up the places where you have
742 since carried on your activities and exclusively in a mining line.

A. After leaving Tonopah I was in New York for some months, making trips from there for Mr. John Hays Hammond on mining examinations, and then decided to locate in Los Angeles and engage in private practice. I went to Los Angeles about May, 1904, and opened an office.

Q. Well, the details of the dates are not particularly material, I think, Mr. Siebert; If you will just give us generally your experience, in what capacities, in actual mining operations. , Mere dates are not *are not* material, it is the extent of your practical contact with mining work that is important. Just a brief resume.

A. After leaving Tonopah, and until I returned to Goldfield in 1907, I examined mines in various parts of Mexico, in all the western states with the exception of Colorado, also in British Columbia.

Q. Examined them for what purpose?

A. For the purpose of purchase principally, or to advise the owners as to operations. I returned to Goldfield in July, 1907, and was employed by Mr. George Wingfield to look after some leases there which he was interested in, and which were heavy producers.

After these leases had expired, I was employed by Mr. Wingfield in making examination of mines with the view to purchase, and finally, in 1908, he appointed me his consulting engineer for all companies with which he was connected, with the exception of the Goldfield Consolidated.

I remained in this position until April, of this year, when I came to Tonopah to engage in an examination of the West End
743 and Jim Butler properties, to ascertain the conditions with regard to geology and for the purposes of this suit.

Q. You have made an examination of the workings of the MacNamara, West End and Jim Butler, and to some extent the adjoining property?

A. I have.

Q. How long have you been engaged in that examination?

A. I first came here in April, I think, about the 14th, and was here continuously until the latter part of June, when I went east, and returned here the 1st of August.

Q. Well, about how long in months have you been engaged in the

study of these mines? Approximately six months, or five months?

A. About seven.

Q. Seven months.

A. I have not been engaged continuously for seven months, but the majority of the time I have been engaged.

Q. And as the result of that examination, have you made yourself familiar with the conditions as exhibited in the workings in these mines so as to be able to state what veins are situated therein, and how they are situated?

A. Yes, sir.

Q. How many veins do you find in the property known as the West End?

A. I have not examined the lower contact vein, as it is called, but outside of that I consider that there are 3 veins.

Q. Name them.

A. The Fraction vein, the south vein, and what is called
744 the West End MacNamara vein.

Q. How long have you known that vein to have been called by that name?

A. Originally; when the vein was first struck, it was called the big flat vein.

Q. And what have you known it as since? The MacNamara West End?

A. I never heard any other name for it until about 1904 or '05, when they began to call it the West End MacNamara vein.

Q. Well now, confining yourself for the time being to the MacNamara West End vein, I wish you would describe that vein generally, where it is found in the works, its character-stics, and the result of your observations as to its position in the ground within the works of the West End, the MacNamara and the Jim Butler?

A. You wish me to use the model to illustrate that?

Q. I am first asking now for a general description of the vein?

A. The vein is what might be termed a contact fissure vein. It is rather flat and rolling, with a general dip in a south easterly direction and with a north easterly trend. It occupies contacts throughout most of its extent, but is, in some cases, a fissure vein in the Mizpah trachyte.

The principal contact rocks upon which this vein lies are west end rhyolite in the foot wall, and Mizpah trachyte in the hanging wall. In some places, particularly in the eastern portion of the West End claim and in the Western portion of the Valley View claim, belonging to the Tonopah Mining Company, the foot wall rock is a glassy trachyte. At other points, the Mizpah trachyte is found in
745 the foot wall, and very rarely the rock known as Montana breccia is found in the foot wall.

The vein is probably the most extensive in area of any vein in Tonopah, and is traceable from a point in the Curtis claim of the Jim Butler Company, through the Eureka claim belonging to the same company, through the West End claim of the West End Company, and through the MacNamara ground, into the Tonopah Extension Company property.

746 Q. In any other direction is the vein traceable?

A. It is traceable towards the east and northeast in the property of the Tonopah Mining Company, and it is traceable also towards the northwest in the California claim, which formerly belonged to the Ohio-Tonopah Company. If it has any further northern *extrations* I am not acquainted with them, further than those I have described.

Q. Where, in what particular section of the veins, as you have described it is the most extensive development?

A. Within the boundaries of the West End claim. And within the MacNamara ground.

Q. In which direction, from this area?

A. In which direction?

Q. Yes.

A. Northerly and southerly.

Mr. Dickson: Just read the question.

(Question read.)

Mr. Lindley: The question was a little bit confused, and I possibly did not have an adequate notion myself about the question.

Q. Now, this vein has been exposed, as I understand it, in the various underground workings, as shown on the model, Plaintiff's Exhibit-2"?

A. Yes.

Q. Now, you are aware that in this case there is a discussion or controversy as to whether this exposure in the MacNamara and West End vein, constitutes two veins or one vein?

A. Yes.

Q. What is your judgment in regard to that?

A. My judgment is that it is an anticlinal vein in this vicinity, and locally dips in both directions, the axis of the anticline running in a general easterly direction, I think about south 80 degrees east, from the eastern end line of the West End claim to a point approximately 1140 feet, crossing the northerly sideline of the West End claim, at that point.

747 Q. You are describing the course of what you understand,——

A. The axis of the anticline.

Q. Now, I wish that you would take that vein, as you say it is from the southerly workings of the West End into the different Raises, and the different places where you have identified it, up to the crest of the anticline, and over, and state when you reach the crest of the anticline, the conditions that you find there and the reasons for your deductions, whether it is one anticlinal vein—and proceed as rapidly as you can Mr. Siebert?

A. Starting at its lowest exposure in the bottom of winze 664 following up this winze to the six hundred level, and then continuing up Raise 664 to an intermediate, and on up to the 500 foot level, the vein is continuous; at this point, or a little east of this point it shows a juncture with what we have designated as a south vein; from that point, as is shown on the model, we can go up through the stopes

continuously from the 500, crossing over towards the eastward and run up into the 400 level. At this point there is some interruption in the development work, and we are compelled to go further east on the same vein in order to follow it up; we pass back into what is called the footwall cross cut, and by coming out to raise 464, which is a vertical raise going back to the vein, we find the vein again in place, and from that follow it downward to a point about thirty feet up in raise 484, thus proving it- continuity throughout that area.

Passing up through the stopes and raises into the 300 level and following the vein eastward for a short distance, we come to another raise which allows us to go into the stopes between the 300
748 and 200, known as stope Five, passing through this up to the 200 foot level, through continuous stopes and on up, past the intermediates, to what is known as the MacNamara stope in which Raise-A is located.

Q. Now, I apprehend Mr. Siebert, that we will admit on both sides the continuity of this vein from the lower workings up to what we call the crest of the anticline, and if you will now take the conditions as they appear, along what we claim to be the crest of the anticline in the different Raises, and what they claim to be the union of two veins, and take the successive point along that line, it will save the necessity of following up all of these stopes. Commencing at the MacNamara stope,—commencing with the development work at that point state the appearance as you find out each point where there is an exposure of what we call the axis of the anticline.

A. In the MacNamara stope,——

Q. Now, I believe that it is accepted that that is continuous in the lower workings.

Mr. Dickson: On both sides. I suppose that there was no question about it.

Mr. Lindley: Well, you may proceed Mr. Siebert.

A. In the MacNamara stope before the defendant had started any raises there, the hanging wall was absolutely smooth and unbroken, showing the roll from south to north, over the crest of this anticline; it was as perfect a hanging wall as I ever saw anywhere, or a hanging-wall streak, I should say, because there is a stringer section above what we have always termed the stope streak or hanging wall of the commercial ore; this hanging wall is exposed along the axis of the anticline of this section for something over one hundred feet. The next exposure of a roll is best,——

749 Q. Just at that point let me ask you a question: Is there anything to indicate on this roll where there is a change from a southerly to a northerly dip, any parting or line of demarcation?

A. There is no line of demarcation whatever, of any character except a change in the direction of the dip.

Q. Is that a gradual or abrupt dip at this particular point?

A. It is gradual, changing from a dip thirty degrees south, to a dip of about thirty degrees north.

Q. Now you may proceed with your explanation,—you say that

there is a stringer section, what you call a stringer section, over the anticline?

A. Yes.

Q. What does that stringer section consist of, will you describe it.

A. It consist- of stringers some of them a fair size most of them rather small, inconspicuous, running at various angles, dipping in various directions, just a mass of stringers, in some cases, more often though widely separated, as you go away from the hagning wall of the vein.

750 Q. How about the character of the ore in the stopes, or in the vein below the stringer section?

A. There is no noticeable difference.

Q. As to the quartz?

A. The quartz is the same practically.

Q. Well, what are the widths of these stopes?

A. Just at that point, I should say they would average 4 feet, right near the crest of the anticline, and widening out going down in both directions.

Q. Well, now, you may proceed with the description of the appearances as they are shown in the workings of what you call the crest of the anticline, taking up the various points in the order of succession from west to east?

A. Following down the axis of the anticline, the roll is again shown in raise 258, which is very near its crest.

Mr. Dickson:

(Q.) Point to it, please.

A. Raise 258.

Q. I say point to it so the Judge can see, if you will.

A. Which is near its crest on its southerly dip (indicating).

Mr. Lindley:

(Q.) You must not get between the Court and the model, Mr. Siebert.

A. I think the actual top of the anticline is shown very near raise 250. The next exposure that is near the nose or toe of the anticline is in the 200 foot level, at about the point I indicate.

Mr. Dickson: Give it a name.

A. It is not marked on the model.

Q. Well, designate it; fix it approximately, as you can, with reference to some workings which are on the model.

A. It is just easterly of a station marked 258 S. W. on

751 Plaintiff's exhibit 1.

Q. 258 S. W.?

A. Yes sir.

Mr. Lindley:

(Q.) Well, proceed, Mr. Siebert.

A. On the 300 foot level the actual apex or top of the anticline is not shown exactly, but it is very close to a point directly over raise 302 A, and in raise 366.

Q. Well, at these different points where you say the crest of this anticline is, is there one or two veins?

A. One vein.

Q. With different dips?

A. It is the crest of the anticline.

Q. And dips in both directions?

A. Dips both northerly and southerly.

Q. Proceed to the next point.

A. The next very good exposure is in raise 494. Raise 494 starts on the 400 level of the West End, and continues up along the vein to a point marked 1392—station 1392. Just beyond this station it is shown that there are two strands of the vein; what we call the foot wall strand and the hanging wall strand. Their point of juncture is just beyond the station I have mentioned.

Q. Where is this, along the summit of the anticline, or down below the summit?

A. This is below the summit of the anticline, where the vein is dipping northerly. We have just recently done some development work on the foot wall strand, or lower portion of the vein to prove its continuity over the roll.

Q. Well, what was the result of that work?

752 A. On this mode- the actual connection is not shown, but it was made day before yesterday. It is on solid quartz right straight through to stope B, and in stope B, the anticlinal roll is shown and you can plainly see it starting on its southerly dip.

Q. Who ran stope B? Who made stope B?

A. Stope B was made by the Defendant Company.

Q. The West End Company?

A. Yes sir. In order to prove the continuity of the upward strand over this anticlinal roll, raise 494 was continued on up connecting with their stope A which was also made by the Defendant, the West End Company. From this raise 2 short vertical raises were put up, and in both of these the vein was proven to be a continuation of the upper strand of the northerly dipping vein.

Q. Showing what?

A. Showing continuity.

Q. As one vein?

A. As two strands of one vein, the upper strand——

Q. And lower strand?

A. Being a part of the lower strand really, and joining it at a point near station 1392.

Q. Where was the crest of the anticline with reference to these two strands?

A. Following on up the raise 494 we come to the crest of the anticline at a point opposite the bottom of 7 A raise, and distant probably 15 feet north. From that point, the upper strand takes a southerly dip and rejoins the lower strand again at rather a steep angle in—the number of that working is not marked on here, but it comes back——

753 Mr. Dickson:

(Q.) You say in the bottom of this raise; what is that?

A. It is a portion of the workings in stope B. And from there it is clearly continuous back to the 400 level of the West End claim, where it has its southerly dip.

Mr. Lindley:

(Q.) I call your attention to Plaintiff's Exhibit section 4; state whether or no this indicates the place where you have just described?

A. That indicates the conditions which I have just described.

Q. Showing the actual connection of two strands; that shows it makes a connection here with the lower streak?

A. Yes sir. But the connection has not been actually driven for a short distance between the top of A stope, and this short level in B stope. There is an intervening gap there of a few feet. The vein, however, a slight distance towards the east is actually continuous and developed.

Q. When you speak of continuous, do you mean continuous from a north dip to a south dip?

A. Yes sir.

Q. Proceed.

A. The next evidence of the anticline is found in raise 496, which is almost a duplicate of 494, except that in one portion of it the Siebert fault has sliced off some of the quartz, not all of it however.

It starts from the 400 level and continues through on quartz up to the B level, and is connected through with the stopes of the B level from where they show a northerly dip to where they
754 show a strong southerly dip. The connections through on B, I might remark, are almost flat in the center, but at each of the edges show the changes of the dip.

Continuing on up raise 496, we come again into the A stope, or the stope on the upper strand of the vein at this point. Just beyond the head of raise 496, this upper strand takes a very strong southerly dip, and is continuous back to B level, where it again rejoins the lower strand, and then the two together unite and are found on the 400 foot level.

The nose of the anticline is developed again to the east on the 400 level where the drifts follow it in an easterly direction and around over its top. This point is probably, the axis of the anticline, or top of the anticline at this point is about 40 feet southeast of the McQuillan shaft. From there going easterly we go into the stringer section, which is found in the hanging wall of the anticlinal roll, on quartz where *is* has not been cut off by the Siebert fault.

Going further to the east, to raise 573 which has been developed on continuous quartz from stope 16 upward, where the vein dips northerly, to a point almost directly under the main 400 foot level of the West End Company, where it reaches the anticlinal roll and starts on its southerly dip.

Mr. Dickson:

(Q.) You mean northerly?

A. Or northerly dip. It has been developed from the top of this roll continuously on the vein for 80 or 90 feet on its northerly dip.

Mr. Lindley:

(Q.) Is the change in direction on the top of this roll abrupt, or gradual?

755 A. Gradual, very gradual at this point.

Q. Proceed, Mr. Siebert.

A. The next exposure of the crest of the anticline is in raise 571, which comes up from the same stope-16, from where the vein is on its southerly dip; the crest or top of the anticline at this point is again almost directly under the main drift of the 400 level of the West End company, and from that point onward is continued approximately 100 feet on its northerly dip. In raise 569 we find somewhat similar conditions; we follow up from stope 16, where the vein has a southerly dip to its crest, which is again almost directly under the main drift of the 400 foot level, of the West End, and starts on its southerly dip; at this point however it is quite flat for some distance before it begins to turn down on its northerly dip; in this immediate section in the hanging wall of the main anticlinal roll is a very strong stringer section, but most of the heavier stringers, I believe, do the same as the quartz found in the A-stopes, and curl over and rejoin the main body.

Q. You have now traced that anticline, have you, from the point to the east as far as it is shown in the workings?

A. Yes.

Q. I understood at one point in your testimony, when you were describing the conditions of this anticline in the middle region, referring to the toe of the anticline,—what did you mean?

A. I meant at the point on any one level where the drift naturally in following around the anticline would form a toe or prow.

Q. There has been something in the testimony referring to the toe at the extreme east end, you had no reference to that; that is a local toe that you have reference to in your description?

A. Yes. It was the one about forty feet southeast of the McQuillan shaft, where it is very nicely developed.

756 Q. Now, you speak of the Siebert Fault. Do you know how that fault came to be named the Siebert fault?

A. Mr. Spurr named it the Siebert Fault.

Q. Are you familiar with the position of that Fault in the ground, and the different exposures where it is observable, have you traced it through the workings to any extent?

A. I was very well acquainted with it when I was with the Tonopah Mining Company.

Q. Are you familiar enough with it now so as to state its position, and its relation to the vein in controversy, and the underground workings of the two mines?

A. Yes.

Q. If so, you may take up the Siebert Fault and explain what its position is, where it lies, and its relationship to the vein, and what it has done or what it does.

A. Starting from the eastern end of the West End claim, we find the fault at its highest point in a raise known as 420, from the 400 level workings of the Jim Butler,—right in the top of this raise, Judge, it is not marked on here as it should be; it is near the top, down probably twenty feet from the top.

Q. Proceed with your description of the position of that fault?

A. It is next found in raise 488, and shows from top to bottom of that raise; it has been drifted along in the 400 foot level of the West End company from this point, for approximately two hundred and fifty feet, and is well exposed; it shows again in raise 461, approximately forty feet and again in a connection between the 400 foot level and 573 raise.

Q. Proceed, Mr. Siebert.

A. It shows again in the top of the vertical portion of the
757 496 raise from the 400 foot level of the West End, and again about half way up 496 raise, between—half way between the B-stope and the A-stope. From this point it is continuous upward over the hanging wall portion of A-stope and tangent at this point to the hanging wall of the stope; it has then been followed upward in Raises 2-A, 4-A, 5-A, 6-A and 7-4; it also shows in the two small vertical raises, from raise 494, which I think were lettered yesterday A. and B.; continuing on to the westward it shows at the foot of raise—it is not marked on that,—at a raise starting at a point very near station 1220-A.

Mr. Dickson:

Q. On Plaintiff's Exhibit 1?

A. On Plaintiff's Exhibit 1, yes. It shows again in a cross cut of the Tonopah Mining Company on their 500 foot level.

Mr. Dickson:

Q. Just indicate that please.

A. Right there, yes.

Mr. Dickson:

Q. What cross cut is that, 500 cross cut?

A. That is all the mark on it, Judge; 500 Tonopah Mining Cross cut; they call that the Red Plume connection; it shows again very prominently in the MacNamara workings.

Mr. Dickson:

Q. At what point?

A. At the point which I am indicating and which is near station T-17.

Mr. Dickson:

Q. On exhibit 1, so that the record will show?

A. On exhibit One.

Mr. Dickson: That is here?

A. Yes, on its upward course it again shows in the easterly portion of MacNamara stope No. 14. It against shows very markedly on

the 300 level of the West End company in cross cuts 303, and at a short point west of there, raise 366 practically follows along
758 under it up to the 200 foot level of the West End, from there is can be followed upward in raise 260.

759 Q. Is that 262 or 260?

A. It is marked 260 here. Coming further west, it is found in raise 258. A little further west than that, raise 252, which I believe is raise 152 on the Plaintiff's model.

Q. On the Plaintiff's model?

A. Or the Defendant's model. Follows along under it almost all of the way to its top. It is found at a point northerly from this in the 200 level of the MacNamara, over the lower portion of the stope 7.

The Court:

(Q.) Point to it.

A. We have stope 7 here. This is the lower portion of stope 7 (indicating). It is found again in raise A, or 200 A, as we have always called it.

Mr. Dickson:

(Q.) It is raise A on the Defendant's model?

A. Yes sir.

Mr. Lindley:

(Q.) Isn't that the farthest western exposure?

A. That is about the farthest western exposure, yes sir.

Q. What is the general shape of that fault? Can you give it any general disignation so as to illustrate it?

A. It is a trough shaped fault, dipping in a general way from west to east, or rather to the north east a little bit.

Q. To what extent, if at all, is it in contact with the vein?

A. It is generally tangent to the upper portion of the anticline.

Q. What do you mean by the upper portion?

A. The top or crest.

760 Q. Well, what do you mean, that portion? Describe that portion of the vein to which this is tangent?

A. It is tangent to the top or crest, where it starts on its northerly dip.

Q. Well, I understood you to define the vein as lying on this anticline, and a condition of stringer section above the anticline?

A. Yes sir.

Q. Does the fault—now, with reference to this stringer section, where is the fault?

A. The fault lies directly on the more solid bodies of quartz, and cuts through the stringer sections.

Q. Cuts through the stringer sections?

A. Yes sir.

Q. What is the condition in raise 569?

A. You mean with reference to the fault?

Q. Yes sir.

Q. Directly over raise 569, we have raise 488 and we do not see

the fault again towards the north, indicating that on its northerly dip it must flatten out. If it had continued its dip, as shown in raise 488, it would have before now been exposed in either raise 569 or in raise 537.

Q. At that point, does the fault cut the stringer section, or cut the main body of the ore below?

A. It does not cut the main body of the ore in that section.

Q. Now, with reference to the hanging wall of the south and north dipping veins, what is the position of the foot wall of tha- fault, as to coincidence for any distance, or at all, or in what
761 direction, and in which direction does the fault move or go from the vein, if it goes from the vein?

A. At the points which I have mentioned, the fault being tangent to the hanging wall of the north dipping limb, it is practically coincident with the hanging wall of the north dipping limb. But in a northerly direction, the fault leaves the hanging wall of the north dipping limb and takes a position above it; at some points as much as 60 and 80 feet above it.

Q. Now, what is the character of the walls of the fault?

A. I could not catch that, Judge.

Q. What is the character of the walls of the fault with reference to the presence or absence of gouge?

A. The fault shows a great deal of gouge, different in character with the rock through which it is passed.

Q. Well, it is a marked, pronounced gouge?

A. It is very pronounced, and particularly where it passes through or is in contact with Midway andesite, which is a very soft rock, there is an enormous amount of gouge.

Q. Well, with reference to the vein itself, the West End Mac-Namara vein, both as to the north dipping and south dipping, what is the character of the hanging wall of those veins, with reference to partings or gouge, if any?

A. So far as I have been able to observe, where they are not coincident with faults, the hanging wall of each leg of the anticline is similar.

Q. Well, how does it compare as to gouge with the gouge in the fault where you are away from the fault?

762 A. There is usually a small amount of gouge on what we called the stope streak.

Mr. Dickson:

(Q.) Called what?

A. The stope streak which is the usual limit of commercial ore.

Mr. Lindley:

(Q.) And above this streak, I understand you, there is a certain zone called what?

A. The stringer zone.

Q. And as a rule, is that the zone that is cut by the fault, or scored by the fault at different points, that stringer zone?

A. Yes sir. The fault, as a rule, cuts through the stringer zone.

Q. Is there any difference between the quartz or vein filling of the north leg and the south leg of this vein?

A. Not that I have observed.

Q. Now, with reference to the western terminus of this vein, it terminates abruptly, doesn't it, or how does it terminate, and up against what?

A. It terminates against a formation called Fraction dacite breccia.

Q. Is that the usual name given to that rock in the camp here, do you know?

A. Yes sir.

Mr. Dickson: Well, we object to that. Let him designate it himself.

Mr. Lindley:

(Q.) Well, what is that rock popularly known as in the camp?

A. Fraction dacite breccia.

Q. Now, you say what becomes of that vein on its westerly
763 course?

A. It terminates against this Fraction dacite breccia.

Q. Explain the appearance of the vein where it terminates against this Fraction dacite breccia?

A. The termination of the vein is rather abrupt, though not so abrupt as it would be if it had been caused by faulting. Beyond the termination of the vein in place, float is found, or pieces of scattered rock, scattered quartz, vein material within and inclosed by the Fraction dacite breccia.

Q. Now, what is the appearance of the vein material, the quartz butting up against this Fraction dacite breccia, and I wish you would explain that quite fully? Have you taken some samples of this, Mr. Siebert?

A. Yes sir, I have, but I forgot to bring them into Court this morning. They are in my office *is* a canvass sack on a table in the back room, Mr. Finch, if you want to telephone for them.

Q. Where is your office, down town?

A. Yes, sir, the Butler office.

Q. Well, I think we had better go on and you can bring those in later. Well, now, describe the appearance of the quartz along the line of this contact with the Fraction dacite breccia, and explain to the Court just what it looks like, and to what extent, if there is a difference in its character or appearance along the plane of the contact, to what extent, if any, it extends in on the vein away from the contact?

764 A. Approaching this contact from the east, and as you near it in distances varying from——

Mr. Dickson: Contact what?

A. Approaching it from the east in distances varying from 200 feet to as low as thirty or forty feet, the vein begins to show signs of oxidation which increase as you approach the actual contact, where in most places it is quite heavily oxidized.

Q. To what is that oxidization, or oxidation, I presume is the modern term,—oxidation due? How do you account for it?

A. Apparently to weathering of an old extensive surface outcrop.

Q. Have you compared this rock, which you say that you have taken along the plane of contact, and which you say the oxidation of it — due to the surface exposure,—due to an ancient outcrop, have you compared that with other outcrops in the camp?

A. Yes, I have.

Q. Do these samples show the two outcrops?

A. Those are samples which I referred to a few moments ago, and which I forgot to bring to court.

Q. Can you explain the character of material which is shown in the series of raises, above the stope marked on Plaintiff's models, as 2-*a*, 4-A, 5-A, 6-A and 7-A?

A. Yes, these raises as I have explained before, all follow along under the Siebert fault on its upward extension, and cut through the stringer zone, which forms a fringe over the hanging wall of the West End—MacNamara vein; the quartz that is found in these raises is disconnected, that is in the sense that it does not form a solid body of quartz; there are stringers running in every direction, which decrease in size and number also, as you leave the vicinity of the top or roll of the crest. These stringers running as I say in almost every direction, some of them are bound to be more or less
765 parallel to the dip of the fault, but they are not continuous. They are also found in the gouge of the fault and immediately under it round pebbles of quartz or drag ore, as it is called.

Q. These rounded pebbles are accounted for in what way?

A. By the grinding action of the fault.

Q. You spoke of this vein as a contact fissure vein.

Mr. Dickson: He has not so spoken of it as yet. Other witnesses have, but not this witness.

Mr. Lindley: Well, you have forgotten, or else you did not hear, Judge.

Mr. Dickson: It might be.

Mr. Lindley:

Q. Did you, or did you not describe this vein as a contact fissure vein?

A. I did describe it as a contact fissure vein.

Mr. Dickson: Well, I do not pretend to be infallible, it is something which I missed.

Mr. Lindley: Well, now we will get another start.

Q. To what extent throughout the area of this vein with which your are familiar, is it a contact vein?

A. I have never figured it out in precentages.

Q. That is, throughout the known area of the vein?

A. Yes, I know. I should say approximately that seventy five percent of the vein lies in contact.

Q. In that answer do you confine yourself to the West End-MacNamara-Jim Butler area, or are you taking the entire area of the vein outside into consideration also?

A. In making that estimate I did not consider the portion in the Tonopah Mining Company, which might increase it a little bit.

Q. Well, now, what is this contact; is it the same throughout the entire mine, that is, the overlying mineral rock is the same,

766 or is there a change in the contact rock?

A. There are several changes in the contact.

Q. Just generally describe the different kinds of contact in which the vein lies?

A. Towards the eastern portion of the West End claim the contact is between Mizpah Trachyte and glassy trachyte, the Mizpah trachyte forming the hanging wall and the glassy trachyte the foot wall. That condition only exists for about 175 feet westerly from the east end line, and beyond that the contact is formed between Mizpah trachyte and the West End rhyolite. This condition exists some little distance west of the Corkhill shaft.

Mr. Dickson:

Q. What is that?

A. The Corkhill shaft.

Mr. Lindley: The Corkhill shaft,—you call it the West End shaft.

A. The vein becomes a fissure in the Mizpah trachyte, except on its northern dip, and in the MacNamara ground it continues to be contact between West End rhyolite and West End rhyolite, until almost to its western terminus, as far as developed. I might add that another point locally due to faulting or erosion that at times the Midway andesite or the Fraction dacite breccia may rest directly on the vein.

Q. I wish to call your attention to Plaintiff's section-12, with reference to the position of those rocks, I wish that you would state what that situation is there. Take it up and show it to the court?

A. Just what do you want me to explain, judge?

Q. The contact conditions as shown on that cross section.

A. On the northern portion of this section, which is a north and south section, we find the West End rhyolite in the foot wall

767 of the north dipping portion of the vein.

Mr. Dickson:

Q. Throughout.

A. No, sir, only for a short distance. I believe, just at this point as it happens, what I have called West End rhyolite is the Monatna breccia, which is the first flow of the West End rhyolite and which is very closely related to it. Throughout the balance of the section the footwall area on the plane of this section is Mizpah trachyte.

768 Q. Is the contact the same on both sides of the anticline in that section?

A. With the exception which I have noted.

Q. Well, in the immediate vicinity of the crest of the anticline, on both sides, on the north dip and south?

A. You mean on the hanging wall side and the foot wall side?

Q. Yes, sir.
A. On the hanging wall side——
Q. Well, can't that question be answered catergorically? No.
A. It can not on this section, Judge.
Q. Well, just explain that. I want to get that point on both sides of the anticline as to whether they are in similar foot wall rocks?
A. They have, with the exception of the north end of the section.
Q. On Plaintiff's section 12. Mark that Siebert 2.
A. Mark this "Siebert 2," you say?

Mr. Colby: Yes. He has already referred to this section here which has not been marked. This ought to be Siebert 1.
Mr. Dickson: Mark that, then, Siebert 1.
(Both sections marked by the witness.)

Mr. Lindley:

(Q.) Now, go back to that section 12. With reference to the vein, as shown in Section 12, is there any difference between the wall rocks of the vein on the north and on the south side of the anticline?
A. None, except as I have noted except at one place here where there has been heavy erosion, the Fraction dacite breccia oc-
769 cupies a position directly on the hanging wall.
Q. How far is that point down from the axis of the anticline?
A. Approximately 310 feet on the dip of the vein.
Q. In which direction?
A. Southerly.
Q. In which direction from the axis?
A. Southerly.
Q. Now, I believe that some specimens have arrived here. Will you look at them and see if those are the ones that you wanted?
A. Yes sir, they are.
Q. Well, will you exhibit them and mark them. Are they marked?
A. No sir, I have not marked them.
Q. Well, exhibit them to the Court and we will mark them now. This will be Siebert 3, the one that you hold in your left hand, you may mark "Siebert 3."
A. I do not believe I can mark them very well without a sticker, they are too much discolored.
Mr. Dickson: There is some mark on this now.
A. Yes, I marked that.

Mr. Dickson: I would like to have them marked in some way, if I wish to refer to them in cross examination.
Mr. Lindley: Of course, we want them marked, Judge; we will have them marked Siebert 3 and Siebert 4.
Mr. Evans: Just put lines down, three lines, and we will put the sticker on later.

Mr. Lindley:

(Q.) Now, calling your attention to the two specimens, Siebert

3 and 4, will you explain what they are, where they came
770 from, and who got them?

A. The specimen marked Siebert 3 I took from the out crop of Burro vein No. 1 on Mizpah hill. The specimen marked 4, Siebert 4, I took from very near the bottom, within 3 or 4 feet of the bottom of winze 664 in the West End mine, which is approximately 40 or 45 feet vertically below the 600 foot level.

Q. How far from the contact of the Fraction dacite breccia?

A. It is at a point where the—or near a point where the Fraction dacite breccia shows in the top of this winze.

Q. Will you explain what difference, if any, there is between the two rocks?

Mr. Dickson: I suppose you mean with reference to oxidation?

Mr. Lindley: Yes.

A. Why, the stage of oxidation, the amount of oxidation appears to be very similar; a little bit more in the specimen from the bottom of the winze, really, than that from off the surface.

Mr. Lindley: Take the witness.

Cross-examination.

Mr. Dickson:

(Q.) Just a few questions, Mr. Siebert, respecting your experience, qualifications. You spoke of having studied geology in what University was that?

A. Ohio State University, and also I had some extra geo-
771 logical study with Professor Orton, who was the Professor at the same University.

Q. Were you taking a general course in the University or a special course?

A. I switched courses several times. I started in electrical engineering, and I do not know what it was toward the finish. I probably would have graduated as a bachelor of science if I had finished.

Q. To what extent did you pursue the study of geology in the University in its cognate branches?

A. Not very far.

Q. Quite limited?

A. Yes, it was somewhat limited. but I think I got most of it from Professor Orton on trips during the summer with him in the field.

Q. How long were you studying with him in the field?

A. I suppose altogether two months.

Q. Where?

A. Southern Ohio and West Virginia, and one trip into Michigan.

Q. Geology with reference to metaliferous veins, or ore deposits?

A. Principally in the coal mining districts and the iron districts.

Q. Now, I take it from your answers, Mr. Siebert, that from the time when you arrived in Nevada in 1898 until you came to Tonopah in November, 1901——

A. Yes, sir.

Q. That your experience in mining was quite limited. I should judge that from what you stated in direct examination so far
772 as giving you any opportunity to study the geology of the country in which you worked, or section; prospecting mostly, was it not?

A. Yes, and I was studying at the same time.

Q. I am speaking of your actual experience in the field. You were prospecting during that period from the time you arrived in Nevada in 1908 until you came to Tonopah late in the year 1901?

A. Well, I was at the Dalton and Lark mine at Bingham.

Q. Your work in the Silver King was in the mill and in construction work?

A. Yes, principally.

Q. And you work- in the Dalton and Lark, how long were you engaged there in the work of mining actually?

A. From February, 1900, until, I think it was December, 1900, or October, 1900.

Q. And when you came to Tonopah in the latter part of 1901, you were employed by the Salt Lake and Tonopah Mining Company, and the property that you had charge of then for some six weeks or two months was practically an undeveloped property?

A. Yes sir.

Q. Practically no work had been done upon it?

A. That is correct.

Q. That is true, is it not?

A. Yes sir.

Q. And you left Tonopah when, 1904, did you say?

A. That was the date of my resignation. I left Tonopah in December, 1903. I had resigned at that time, but my resignation had not been accepted and was not accepted until the follow-
773 ing April or May.

Q. And you left Tonopah in the latter part of the year 1903?

A. Yes sir.

Q. And then after your return from New York, you went to Los Angeles?

A. Well, I was in New York for several months.

Q. What?

A. I was in New York for several months.

Q. I say, after your return from New York you went to Los Angeles, or am I mistaken about that?

A. I was in New York for several months working for Mr. John Hays Hammond, making special trips for him, and I think it was in April or May, of 1904, that I went to Los Angeles.

Q. Now, when in Los Angeles, were you engaged there chiefly with the business of promoting the sale of mines?

A. No sir, I was engaged chiefly in examination of mines for others.

Q. You did not return to Tonopah to engage in any work in connection with mines until April of the present year?

A. No sir, I have been in here on several trips and have been through the mines at various times, but not professionally.

Q. Not professionally. Just as a matter for your own personal observation?

A. Yes sir.

Q. Have you pointed out in your direct examination all of the places where you have seen what you claim to be the Siebert fault? If not, if there are any other places where you have identified it to your satisfaction, I wish you would do so?

774 A. I do not recall any other places just now. I have been through the McQuillan shaft at this point where it should be, and where it undoubtedly is, but——

Q. Where you did not see it on account of its being lagged?

A. It was lagged over. I could see some little evidence, at least, but I was not sure about the identification.

Q. Where in the McQuillan shaft did you see any evidences of it, or what you believed was it?

A. About 15 feet above the 400 foot level.

Q. Where it is colored in blue on this?

A. Where it is colored in blue, yes sir.

Q. In the McQuillan shaft?

A. Yes sir.

Q. Just below the green, and just above the red?

A. Yes sir.

Q. Now, any other place which you have not called attention to in your direct testimony?

A. I believe there is one place that I have not mentioned, although I mentioned raise 36 .

Q. Yes, you mentioned that.

A. Which is very close at hand. I did not mention the top of raise 302 A.

Q. In the immediate vicinity?

A. In the same vicinity. I think I carried it on up there (indicating).

Q. Well, if you think of any other places that you did not point out in direct examination, please do so now.

775 A. That is all that I can think of, Judge, there *us* a point on the 600 level here, which might be,—the 600 level of the Tonopah *Mining*.

Q. The one near its northerly end?

A. Yes,—which might be the Siebert fault.

Q. In your opinion, is it?

A. In my opinion it very likely is althou*hg* I would expect at that point that the Siebert fault would be a little bit higher, than that; it is a fault very similar in appearance.

Q. I understand that you are inclined to the opinion that it is the same Siebert fault?

A. Yes, either the main portion of it or one of its branches.

Q. Have you seen where it runs?

A. It does apparently branch in other places.

Q. Have you seen where it branches?

A. I have not seen the actual branching, no sir.

Q. How large a fault is it in thickness,—any opening, or cracks or seams?

A. It varies as I said before with the rocks through which it passes and it would be hard to give an average thickness for the gouge, but I should say that there is over a foot of gouge in it.

Q. In some places?

A. On the average.

Q. What is the strike?

A. The strike——

Q. And the various places where you have observed to be what you believe to be the Siebert fault, did you observe the strike?

A. I observed the strike of the movement.

Q. Of course I mean of the fault?

A. It is swinging,—it has so many strikes, it is trough shape.

776 Q. What is the general direction of the dip of that fault?

A. Just as I say it is trough shaped; it dips towards the north and then swings around until it is dipping east, and swings on around until in places it is even dipping south, but the movement along the fault seems to have been in a general direction north sixty-five east, about; that is as indicated by the striation.

Q. Is it troughed so far as you have been able to state—so far as you have been able to study the characteristics of the Siebert fault,—is the trough a general feature, or is it only in places that you have been able to observe anything indicating that it had a trough shape?

A. No, it would take a general observation, of course, over the whole fault to arrive at the theory of a trough shape.

Q. I mean so far as you have examined it. Base your opinion on that throughout that territory?

A. Yes.

Q. Is it generally in the shape of a trough dipping both northerly and southerly?

A. No, directly in the distance examined. In order to get the full evidence for that shape you would have to carry it over into the Tonopah Mining Company.

Q. Have you any evidence of that shape in the territory here under examination?

A. Yes, there is some evidence of it.

Q. Where?

A. Take the strike of the fault along in the hanging wall section of the north dipping limb of the anticline, we find it coming down rather steeply towards,——

Q. Towards the crest——

A. Towards the crest and above the crest and then flattening out somewhat in that shape.

777 Q. You judge that it flattens out from the fact that it is not encountered where it would have been encountered had it continued its steep dip?

A. Yes, there is evidence at such points as I have indicated before.

Q. Well, point out some places where you have it changing from the steep dip southerly, at and above the crest of its anticline, to a flat dip, or to a dip southerly, which would be necessary to produce a trough shape?

A. There is a very marked change in the dip in the vicinity coming from 366 and 302-A raises.

Q. Which are noth in the same——

A. Yes; over here, coming down in the lower portion, the eastern portion of stope marked—14, in the MacNamara ground, that is quite a flat dip locally there.

Q. Well, you had a steep dip above?

A. Yes.

Q. Where do you have a flat dip?

A. Then carrying it over the eastern end of the stope just mentioned to the 500 foot level of the Tonopah Mining Company, you will see that you have a very slight dip.

Q. Yes, a very slight. That is not the only fault in the country by any means?

A. No.

Q. And not the only fault in which gouge is found in the walls?

A. No, sir.

Q. What is the dip of the Siebert fault, as shown in raise 488? Give it to me with some precision?

A. It is approximately forty degrees; that is as near as I could,——

Q. In a general northerly direction, or, is it, the direction of the dip of that fault, as disclosed?

Mr. Lindley: What raise are you talking about?

778 Mr. Dickson: 488.

Mr. Lindley: Taking the dip of the raise or the dip of the fault?

Mr. Dickson: The dip of the fault.

Mr. Lindley: Assuming that the raise goes up on the dip?

The Witness: It does not quite follow the dip.

Mr. Dickson: What I am after, not the dip of the raise, but the dip of the fault, and the direction of the dip of the fault, as it shows in that raise.

A. That would be about it, about forty degrees.

Q. And what direction is it?

A. The direction of the dip would be slightly east of north.

Q. What would be the angle of dip necessary to connect that fault at the bottom of raise 488, where you have what you believe to be the same fault here out near the northerly end of the 600 level of the Tonopah Mining Company, where you have a blue streak shown in the green; where you have it in raise 488?

A. Well, that is pretty hard to get at.

Q. You can get at it by taking the horizontal and vertical distance,—can't you do that?

A. Yes.

Q. Just take it that way, if you please.

A. I can give it to you right here, Judge. About twenty three degrees.

Q. You spoke of following that fault from the bottom of 488 raise westerly for what distance—400 feet?

A. 250 feet.

Q. 250 feet. Are you following there along the strike of the fault—I suppose so, for it is all on the same level?

A. Yes, that is approximately along the strike of the fault,
779 at that point.

Q. Then you have it again, as I remember your testimony, as you go westerly, there are some intermediate points here?

A. Up in the stope, that would be up on its dip.

Q. Just about where in the stope, or easterly edge of stope-14 in the MacNamara ground?

A. Just about that point there(indicating).

Q. Can you designate that anywhere—in anyway?

A. It is not marked.

Q. The first upraise in stope 14, as we go westerly from its easterly terminus, at the top of that you find it?

A. Yes, also the fault is observable over this cross cut here.

Q. Out that far where you encounter it in those places, have you been following it on its strike from the MacNamara shaft or the bottom of raise 488?

A. The fault is felt at this point and don't show again until you get here up in this raise.

Q. That is in what raise?

A. That is the one that is not numbered; I gave a station number that was near that,—station 1220-A.

Q. Well, having followed it on its strike for 250 feet westerly, along the 400 West End level——

A. Yes, that is where it is exposed all of the distance.

Q. No,—I have not finished the question. Having followed it westerly from the bottom of raise 488, for a distance of 250 feet along the 400 West End level, and then finding it again in this raise at a point near station——

A. 1220-A.

Q. Wouldn't you believe that it continued on its course or strike to the place where you find it there?

780 A. I would, yes.

Q. That would be a distance of about how far from the bottom of raise 488? A few feet one way or the other does not make any difference,—an approximation.

A. About 620 feet,—Oh, excuse me, I had the wrong side of that scale. About 490 feet.

Q. And then we follow the cross cut, or a cross cut going northerly from the 400 West End level, starting about 60 feet I should judge westerly from the raise in which you found it, near station,——

A. 1220-A.

Q. About forty feet westerly of that station, there is a cross cut winding out northerly from the 400 level of the West End.

A. Yes, sir.

Q. Where in that cross cut do you encounter, if at all, what you regard as the Siebert fault?

A. At a point where the MacNamara workings connect with the workings of the Tonopah Mining Company, near station T-16. There is about fourteen or fifteen feet different- in elevation between the two levels at this point.

Q. And where next in this cross cut, if at all, do you find it? Nowhere do you?

Mr. Lindley: Where next in the cross cut?

Mr. Dickson: Yes. Nowhere I think, it is not indicated.

Mr. Lindley: The Cross cut passes through it. Oh, that is another cross cut.

A. At a point in the Tonopah Mining Company cross cut,——

Mr. Dickson: 500.

A. 500 foot level.

Q. Mark on the Plaintiff's exhibit-2, "500 T. M."

A. Yes. Approximately 155 feet in an easterly direction
781 from station "T-13."

Mr. Lindley: I was simply going to call your attention to the fact, that there ar some discrepancies in his testimony owing to the difference in the scale.

A. I am doing all my measuring judge on the small model, so far.

Mr. Lindley: There would be a wrong direction owing to the difference in the scale.

Mr. Dickson: The scale of the model is forty and that is what you have used?

A. Yes.

At this time an adjournment was taken until two o'clock P. M. December 17th. 1914.

782 Afternoon Session, 2 o'Clock p. m.

The Court: Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Cross Examination of FRED J. SIEBERT, Resumed.

Mr. Dickson:

(Q.) Mr. Siebert, we have followed what you take to be the Siebert fault on its strike from the bottom of 488 raise, along the 400 level of the West End workings to and beyond where you find it in this raise, near Station 1220 A, is that right?

A. Yes.

Q. Now, another place where you found it in the workings marked

500 T. M. which I understand means the 500 of the Tonopah Mining Company?

A. Yes, sir.

Q. About where—about how far easterly in that level of the figure 5 in 500 is it that you encounter what you believe to be the Siebert fault?

A. I gave you before the distance from Station T 13.

Q. Well, we can get it this way without going to look at some of those exhibits; how far easterly from figure 5 in 500?

A. Approximately 37 feet.

Q. Now, having followed it on its strike on the 300 level from the bottom of 488 westerly to and beyond where we find it in the raise near station 1220 A, what do you say as to whether or no where you get it in the 500 level of the Montana Tonopah——

A. Tonopah Mining Company.

Q. Whether you encounter it there on its strike or on its dip?

783 A. We encounter from its footwall side and encounter it on its dip more than on its strike. Its strike is across the working.

Q. In which direction?

A. Across the workings.

Q. The strike is across the workings.

A. Yes.

Q. Then speaking generally that fault on its strike has run in the direction from the bottom of 488 raise, westerly and northwesterly to and beyond, where it is found raise near 1220-A, and then when we go over to where it is found in the 500 level or cross cut of the Tonopah Mining Company, its course is practically at right angles to its former course, if its course is across that cross cut?

A. The course which I have described illustrates the trough like shape, of which I have spoken before. It swings from a general northwesterly course to a general northeasterly course, and also its northwesterly course has a steeper dip as shown in the 400 level, than it has where it is shown in the MacNamara workings and in the Tonopah Mining Company's works where it flattens out very considerably.

Q. At present I care nothing about that. You stated in the early part of your cross examination that the workings here concerned, in this part that is here in controversy, under discussion or investigation, that your only reason for supposing that it had taken a flatter dip, than where encountered in 488 raise and other raises, and passed from the vein, that if it had not so changed dip that it would have cut the vein in places.

—. ——.

Q. The main vein?

A. Yes, sir.

Q. What is the difference in elevation between where we have the Siebert fault 30 feet east of the figure five in the 500 T. M. and the bottom of the 488 raise, if any?

784 A. I do not think that the elevations are marked on these maps.

Q. Well, you can give it approximately can't you, from looking at the model?

A. I should say that it was not over twenty feet.

Q. We have again, as I understand the Siebert fault not only in the 488 raise, but in the 461. What is that raise?

A. 2-A.

Q. "-A, 4-A, 5-A, 6-A, 7-A in 366 raise?

A. You overlooked 496.

Q. Well, include 496 at the top of those perpendicular raises. You have it again in the raise marked 366?

A. Yes, sir.

Q. Where we find a streak of blue across that raise, above what is colored in green on the raise?

A. Yes, sir. Above what is colored in purple really.

Q. Now in what is colored in purple and above what is colored in green.

A. Yes, sir.

Q. And where you have the blue marked across that raise?

A. Yes, sir.

Q. Then you have it again in this little raise, which I now point to?

A. Yes, sir.

Q. That hasn't any number, can you give us any station number on that?

A. There is a number on top, it is marked 252.

Q. 252 on Plaintiff's model.

A. I think that you have a different number for that. I am not certain. It is marked 252.

Q. It is marked 252 on the Exhibit of the Plaintiff?

A. Yes.

Q. Then you have it again in the A-raise?

A. Yes, and also in what is marked on this model 262 which is the same raise that is marked 152 on your model.

785 Q. Where is that?

A. This one (indicating).

Q. Well, having it on the 488 raise, the 2 A, 4 A, 5 A, 6 A, 7 A raises, and where it is encountered in the 366 raise and in the A raise, would you suppose that you had been following it there on its strike from the 488 raise to the A raise?

A. Why, they are at very different elevations. You could not follow its strike along a line of that kind or character. That would be following partially on its dip.

Q. Well, wouldn't that represent, approximately, taking into account now the difference in elevation, the raise in the ground as you go to the west, that you are following practically on the strike of it?

A. No, sir.

Q. You have it in 2 places in the raise near station 1220. One to which I now point, a short distance above the 400 West End level, and again in a cross cut or piece of work about midway, running

about northwest, I take it, and starting about midway—northeasterly—of that raise. Where you have it there near station 1220 A, you say you have it on its strike. Have you it on its strike or dip at the other place in the cross cut running out from that raise where you have the blue color to indicate or represent the Siebert fault?

A. The blue color in the intermediate, which is run from the raise which you pointed out, indicates its strike to a certain extent on that level.

Q. Yes.

786 A. But that is considerably higher than the 400 foot level, where you asked me to define its strike before.

Q. What is its dip where you first encounter it in the raise near 1220 A, the angle of the dip and direction of the dip?

787 A. Its dip at that point would be approximately thirty degrees.

Q. That is between the two places where you find it in that raise?

A. In the bottom of what we call the sideline raise, and the point where it is cut in the cross cut.

Q. Near station 1220-A approximately?

A. Approximately thirty degrees.

Q. Does it go down on the true dip of the fault fissure?

A. It does at that point, yes sir.

Q. What is the dip of the Sievert fault where you have it represented in blue in the 366 raise?

A. Taking it from that same intermediate cross cut, where it shows in 366 raise, it would be approximately thirty degrees.

Q. In what direction?

A. At that point it would be about north seventy-five east, taking those two points.

Q. What is its dip in the A-raise in what direction?

A. In the A-raise, I remember the direction of the A-raise which is south forty west.

Q. What is the angle of the Siebert fault?

A. It is pretty hard to get at, if an approximation would be correct enough——

Q. Well as close an approximation as you can give?

A. It is in the neighborhood of thirty degrees.

Q. Does that raise follow up on the true dip of the fault, or is it quartering?

A. Quartering.

Q. Can you tell or give me an approximation of about what the angle of dip would be, if you went up on the true dip of the so-called Siebert Fault where it is disclosed in A-raise?

A. It would be flatter I would say.

Q. Flatter?

A. Yes.

788 Q. Flatter on the dip?

A. Yes, because the fault at that point makes a turn. If you went up on the true dip you would go up on a course about north seventy east, at that point.

Mr. Lindley:

Q. North seventy east or north seventy west?
A. North seventy east.

Mr. Dickson:

Q. And the dip would be what?
A. The nearest place that I can get at the dip is not shown here. Taking it from the top of the 200-A raise down to the first place as shown in the MacNamara——
Q. The east edge of stope-7.
A. The east end of the first intermediate of the MacNamara; it shows a dip of approximately eighteen degrees.
Q. Is this the three hundred (indicating)?
A. That is the 500 West End level.
Q. Notwithstanding the A-raise is not put up on the true dip of the Siebert fault fissure, nevertheless, the appearance to anyone who would go there and observe it is that the A-raise goes up as a continuation of the northerly dipping portion of the stope shown in that vicinity,—does it not?
A. No, sir, because——

Mr. Lindley: Let him finish his question.
Mr. Dickson: Well, I just want to add a little more to the question.

Q. In the hanging wall which you follow up in A-raise, would there be an appearance of the hanging wall, of a continuation of the hanging wall, in the stopes dipping northerly below the bottom of it?
A. The hanging wall rolls over the anticline, and the raise continues on up at about the same angle as the hanging wall
789 on this northerly dip but it is not a continuation.
Q. My question is would not it appear to the ordinarily intelligent observer that the hanging wall which is followed up by the A-raise is continued and in conformity to the hanging wall of the stopes dipping northerly from the foot of that raise—isn't that the appearance?
A. I don't know what the ordinary observer would think of it.
Q. Well, you cannot divest yourself—in answering that question you cannot divest yourself of your scientific acquirements, so as to say how it would appear to the ordinarily intelligent miner?
A. I think that I explained that, that the hanging wall continues up at about the same angle,—the raise continues on up at about the same angle as the hanging wall.
Q. So that the appearance is that the hanging wall that you have in the A-raise, would be a *oc*ntinuation in direction and in dip, inclination of the hanging wall of the stopes dipping northerly immediately from the bottom of that raise?
A. In so far as its dip is concerned only.
Q. What?
A. In so far as its dip is concerned only.
Q. Where, as you follow down from the top of the A-raise, fol-

lowing its hanging wall down to the bottom, and then start off on the northerly dipping stopes from that bottom, do you find anything to indicate that you pass from one hanging wall into another hanging wall?

A. Yes.

Q. Where, I say?

A. At the foot of that raise you can very clearly see the Siebert fault going off into the hanging wall of the stope.

790 Q. But the hanging wall itself at the top of this raise, or the top of the stope—just at the bottom of the A-raise and on upward, is there anything to indicate that you pass from the hanging wall of one formation to the hanging wall of anything else?

A. I have just explained that the interruption or difference is at the bottom of that raise where the fault very clearly goes out and over the hanging wall of the stope.

Q. Has the fault dislocated the vein there?

A. It has not.

Q. Has it dislocated anything found in the A-raise?

A. It has dislocated the stringers.

Q. Dislocated the quartz that is in place in the A-raise if there be any?

A. You can very clearly see where the stringers are cut off and abutt against the fault in A-raise.

Q. Near the bottom?

A. Principally near the bottom but all the way up so far as that is concerned.

Q. Now what is the dip of the Siebert fault, the 2-A 4-A 5-A 6-A and 7-A raises? Approximately the same I take it?

A. Approximately about thirty degrees.

Q. Do these raises severally go up on the true dip of that fault?

791 A. At that point they are very near to the true dip of the fault, at that point.

Q. Unless the direction of the dip, the direction, the angle of the dip as followed from the top to the bottom of each of those raises had very materially changed, flattened, that fault should have been cut, should have been disclosed in the 500 level of the West End running out northerly from the McQuillan shaft, shouldn't it?

A. It should have been.

Q. And the mere fact that it has not been so encountered is what you base your judgment upon that it has flattened?

A. Not altogether.

Q. What else?

A. The fact that it has not been encountered in 533 A raise from the level which you have described, the 500 level of the West End.

Q. It should have been cut in that if it had not changed its dip?

A. Yes sir. It also should have been cut in the raise 537 from the 500 foot level of the West End if it had not changed its dip.

Q. I say the fact that it has not been cut, what you call the Siebert fault has not been cut in those workings *in* the basis for your

judgment that that fault has gone down to the north at a flattened dip?

A. Another basis for my judgment——

Q. Is that part of the basis?

A. That is part of it, yes sir.

Q. What else?

792 A. *Is* that as we go westward or north westward along the Siebert fault and into the MacNamara ground, we find it dipping at angles as low as 2 or 3 or 4 degrees, some places almost horizontally.

Q. Where?

A. Right in through here (indicating).

Q. Point to the places.

A. In through this portion here (indicating).

Q. The record will not show where you are pointing.

A. This is the eastern end of the stope in the MacNamara ground marked 14, where it is the most flat.

Q. Where else?

A. In this vicinity, if I may be allowed to glance at my notes, I can give you the exact dip.

Q. Certainly.

A. I haven't got the exact dip, I thought I had. I marked it "nearly flat."

Q. Well, that will do. Has the Siebert, fault, or what you take to be the Siebert fault, where disclosed in 2 A, 4 A, 5 A, 6 A, and 7 A raises faulted the vein?

A. No sir, it has not faulted the vein except in some cases the indications are, as in 496 raise, that it has sliced off a portion of the vein. It has not in any case interrupted the continuity of the vein.

Q. The faulting upon the Siebert fault, as I understand, has been very considerable, a hundred feet at least, or more, in an easterly and westerly direction, and an unknown distance in a drop?

A. We do not know the easterly and westerly displacement.

Q. Well, I understood Mr. Finch to say that it was at least a hundred feet, and how much more he did not know?

793 A. That is northerly and southerly.

Q. What?

A. Northerly and southerly.

Q. Northerly and southerly?

A. Yes sir; in following down on the contacts of the Midway andesite and Mizpah trachyte from the point at the top of this raise to points in here (indicating).

Q. In here you mean——

A. In the McQuillan shaft.

Q. So the faulting has been in a northerly and southerly direction on the plane of the Siebert fault, is that right?

A. No sir. All indications are that the movement along the fault has been about north 60 or 65 east.

Q. Yes.

A. But in moving in that direction, it has made a northerly and

southerly displacement which shows on the plane of a north and south cross section.

Q. So there are two components to that fault, one north 60 east, or thereabouts, and the other——

A. There is only one component that I know of, and that is north 60 or 65 east.

Q. Well, how do you account for your displacement in the other direction?

A. Smply the displacement that would show on the plane of a vertical cross section, and does not represent the whole movement of the fault at all.

Q. At all events, does your observation lead *to* you to the conclusion that there has been quite extensive faulting displacement along the line of the Siebert fault?

A. Yes sir.

794 Q. You find no evidence of it as having interfered with or interrupted the vein as you go down either one of these A raises, this series of raises, displacements to any extent?

Mr. Lindley: Mr. Dickson, as I understand the testimony, is that it has not touched the main vein. How can it displace it?

Mr. Dickson: The witness, Mr. Lindley, can protect himself there.

Mr. Lindley: I do not want any false assumption.

Mr. Dickson:

(Q.) I am just asking, is it not true that as — follow it down the A series of raises, follow this fault down to their bottoms, that you discover no displacement of the vein?

A. Except as I have described, what might be a displacement of a portion or a slice off of the main vein. But it has not destroyed the continuity of the vein in any case, nor has it cut through it.

Q. Does not the north dipping branch or leg of your anticlinal fold lay in and along a fault plane from east to west? What I mean by a fault plane, I do not mean one of any great dimensions, a great amount of displacement, but along a fault plane?

A. No sir, it does not.

Q. Not at all?

A. It does where the Siebert fault is tangent to the anticlinal roll.

Q. How is that?

A. Where the Siebert fault is tangent to the crest of the anticlinal roll.

Q. I am not speaking about the Siebert fault. I am speaking about the north dipping leg or side of the anticlinal fold.

795 Do not these stopes and the vein so far as developed on that northerly dipping leg or branch lie in and along a fault plane from end to end?

A. No sir.

Q. Not at all, nowhere?

A. Except as I have described toward the crest of this anticlinal roll, where the fault is tangent to it.

Q. You are speaking now in that last portion of your answer of the Siebert fault, I take it?

A. Yes sir.

Q. Are we following in the vein from the McQuillan shaft along the 300 or 400 West End level to the raise near station 1220 A; is that in the vein?

A. Yes sir, in the north leg of the anticline.

Q. And that portion of the vein is right along the strike of your Siebert fault, isn't it? Is it in your Siebert fault?

A. No sir. The last we see of the Siebert fault is in a cross cut opposite the bottom of 496 raise, and we do not see it again along that drift which you have just mentioned until we come to the bottom of what we call the side line raise, and up that raise a distance of about 15 feet.

Q. But you answered me this morning, Mr. Siebert, that in your opinion from 488 raise westerly along the 400 west end level to the raise where you can find it near Station 1220 A, throughout that entire distance you had the strike of the Siebert fault?

A. I explained to you that it probably existed out in the hanging wall from this level for this intervening distance.

796 Q. Lying just above it?

A. Yes, lying just above it. But it is not shown there for a stretch of approximately 300 feet, I should say, maybe less. For a distance of 260 feet it does not appear in the drift.

Q. In your opinion, it lies just above it?

A. Yes sir.

Q. Just skirts over the top?

A. Yes.

Q. Just like it skirts over the top of the quartz found in these several raises that we have been talking about. If your Siebert fault, as disclosed in the 488 raise, has not changed its dip as found in that raise, where should it intersect this work to which I am now pointing, running—the 569 raise, so called, connecting the southerly dipping stopes with the 537 raise? About where in the 569 raise would the Siebert fault have cut that line of work had it continued on in the dip which it has in the 488 raise?

A. It would cut through 537 raise at just about the point where 569 raise goes off from it.

Q. That would be southerly of that, would it not, some distance? About where this straight edge cuts it, wouldn't it?

A. Well, it would slice off a portion of the top or 569.

Q. About how far southerly of 537 would it cut that raise, that 569 raise?

A. It would first cut it in the top about 15 feet southerly from the south edge of that raise,—south side of that raise.

Q. In 2 A raise, have you not a body of quartz going up

797 that raise, I do not remember the exact distance, for a goodly number of feet, unbroken, not stringers, but one solid mass of quartz from 2 to 3 feet in width or thickness?

A. There is quite a continuous stringer, yes, in that raise.

Q. Well, would you speak of a body of quartz 2 or 3 feet wide as a stringer?

A. I don't remember that it is that wide.

Q. Are — prepared to say that it is not at least that wide?

A. I am not. I haven't the detail of that raise with me at this time.

Q. Going up 4 A raise, have you not quartz there the thickness of 4 feet, and continuing up not less than 2½ or 3 feet for more than 50 feet above the bottom of the raise?

A. No, sir, it is not continuous. That is 4 A you are asking about?

Q. I say for 40 or 50 feet from its bottom?

A. Starting in at the bottom there is a distance there of about 25 feet where there are just mere stringers, and from that on for a distance of say about 40 feet or maybe a little over, there is quite a continuous quartz stringer.

Q. Haven't you in the bottom of 4 A raise a body of quartz more than 4 feet thick, just up from the bottom?

A. Not up from the bottom. The bottom of it really is right at the top of the anticlinal roll, and there is considerable quartz there.

Q. Well, it starts out at the top of the anticlinal fold, judging from the picture here. Now, the first——

Mr. Lindley: One moment. He has not answered, that,
798 Judge. You made a statement which he has not responded to.

Mr. Dickson: Well, am I correct that it starts at the 4 A raise at its bottom, at the top of what you call the anticlinal fold?

799 A. It does start out from the top.

Q. Now, from that bottom up for a goodly number of feet, say eight or ten feet, haven't you quartz there from four to five feet thick not any stringers, but one mass of quartz of that dimension?

A. I do not recall it, judge. There may be a portion of the top of the anticline in the raise. But between that and the next quartz is a distinct interval.

Q. I did not hear the last of that answer.

A. I say I do not recall it. There may be a portion of the top strand of the main anticlinal vein right in the bottom of that raise, but before we come into the stringer which you mention, there is a distinct interval in which there is no quartz but very small stringers.

Q. Do you find any quartz in 2-A raise, in place, as though it occupied the position now in which it was originally deposited?

A. Yes, sir.

Q. Is that true of 4-A raise?

A. I consider all of the stringers that show in those raises as being in place.

Q. Do you call every exposure of quartz that is found in those raises, a stringer, notwithstanding what its dimensions may be?

A. I regard it a stringer forming a part of the same conditions that exist in other parts of the mine; I consider the condition found in the raises, identical with the condition found in the hanging wall

section of the big vein at other points, except that in those raises they have been cut off by a fault.

Q. If you followed a body of ore in Raise 4-A—I do not want to take each one up—from its bottom to where it encounters cap rock, 4 ft. thick, would you call that a stringer?

800 A. No, sir, not if it was 4 ft. thick.

Q. And carrying in places commercial value, would you call it a stringer?

A. Not, if it were continuous and in line.

Q. Have you noticed——

Mr. Lindley: One moment. Go on Mr. Siebert and complete your answer.

A. If it were continuous and in line, and well defined in every way and having a foot wall and hanging wall, I would not call it a stringer.

Q. Hasn't it a hanging wall where found in those raises?

A. No.

Q. A distinct hanging wall of gouge?

A. No, sir. It has the Siebert fault overlying.

Q. That is gouge isn't it?

A. Yes, it is gouge, but it is distinctly later than the vein if there be a vein.

Q. Have you a note of your observations in 4-A raise, as respecting the dimensions of the quartz found therein, or are you simply now speaking from recollection?

A. From recollection.

Q. How long since you were last in there?

A. It is possibly a month since I was in 4-A raise.

Q. Now how long since you were in 2-A, 5-A and 6-A and 7-A?

A. About the same time.

Q. And you have no notes of what you observed?

A. Not with me, no, sir. In explanation I might say that I helped Mr. Searls in detailing the quartz found in those raises and in making accurate cross sections, and those notes are in Mr. Searls' possession, and I have no doubt he will present them.

Q. But you speak simply from general recollection?

A. Yes.

801 Q. You have not been and never were, were you, in the stopes on the north dipping leg, side of your so-called anticlinal fold while work of stopeing was going on?

A. I never saw any work going on. I was——

Q. Were you in those stopes while the work that had been done was still fresh, very recent?

A. No, sir.

Q. If there were a clay gouge on the hanging wall of the north dipping branch or leg of this north dipping anticlinal fold, and the ore stoped out up to the gouge, and a then very considerable time had elapsed, with the air circulating in the mine, would the gouge not dry and fall away from the over hanging wall?

A. It might and it might not. If it had dried and fallen away it would probably by lying in the floor of the stope, if there had been no work going on.

Q. Did you look in the floor of the stope to see if any of it had fallen off?

A. I don't remember that there was any there.

Q. But did you look for it?

A. I did not look for it particularly, I did not imagine that that would be important.

Q. So that you are unable to say from your observations?

A. Yes.

Q. There may have been a clay gouge overhanging the ore, between that and the solid hard rock through out the stope on the north dipping leg of your anticlinal fold—is that not true?

A. I did not get that, will you please read the question?

Q. I will put the question again. From what you are able to say, from your means of observation, may it not be true, that overlying the ore, between the ore and the overlying hard country rock, there was a clay gouge extending through out the stopes on the northerly leg or side of your anticlinal fold?

802 A. There are some pillars left in the stopes there which do not exhibit gouge of any amount.

Q. Do they exhibit any?

A. Oh, they might exhibit a very small seam of gouge and the north dipping limb exhibits a very thin seam of gouge; I think that it is on the three hundred foot level, but not to compare with the gouge in 200-A, for instance.

Q. Or our Raise-A?

A. Your Raise-A, yes, sir.

Q. Is that the extent of the answer that you desire to make to that last question?

A. I cannot think of anything further to answer that question.

Q. The thickness of the gouge on any fault plane would be governed largely by the character of the rock through which the fault has passed, together with the motion upon the plane of fault?

A. Yes.

Q. The softer the rock the thicker the gouge, which you would expect to find?

A. Yes.

Q. How thick is the gouge in 488-Raise, have you any note of it?

A. Well, I should say that it is over a foot.

Q. Well, you are prepared to say that?

A. That is the best of my recollection.

Q. And is that true of 2-A, 4-A, 5-A, 6-a & 7-A raises, and A Raise?

A. I think that it would average in the neighborhood of a foot.

Q. Varies in thickness in those other raises?

A. I didn't understand.

Q. Does it vary in thickness in each of those comparatively short raises?

A. To some extent, yes.

Q. About these stringers that create Mr. Finch's halo, point out some apart from these raises, of the larger stringer, that form that crown of grace?

803 A. The best exhibition of the same condition that exists at the crest of the anticline, of the big anticline in the West End MacNamara vein, is found in a cross cut known as 712.

Q. Where?

A. 712 in the Jim Butler ground.

Q. Show me that, point that out to me, please.

A. (Indicating.) Along in this section here.

Q. Now, identify that for the record, please?

A. 712 cross cut in the Jim Butler.

Q. Is it marked so on the model?

A. It is not.

Q. Well, mark *is* 712-S, on the model.

A. (Witness indicating on model.)

Q. Now, in that vein which you have just marked in pencil, 712-S, where is it that you find the stringers cutting into the hanging or foot country?

A. For the total length of the cross cut from where it leave the Fraction vein to where it enters the big vein.

Q. Give me where you find those fissures or those seams and the dimensions of each, thickness of each?

A. I could not do that judge, it is just a mass of interlacing stringers with an occasional large one.

Q. Where is the largest one that you find?

A. The largest one is near the top of the main vein, where it makes another anticlinal roll.

Q. Where you are now pointing?

A. Where I am now pointing.

Q. You have an anticlinal fold there?

A. Yes, and just beyond that there is a vein as indicated on the model here, where that short cross cut is, which I should say would represent three or four or five feet of solid quartz.

Q. Have you a note of it—its dimensions?

A. I have indicated it on here.

804 Q. That is free hanf drawing was not drawn to scale I suppose?

A. No, but it is very close to scale. It would show on here about three feet.

Q. It has not been followed up——

A. For a short distance.

Q. Upward?

A. Yes, sir.

Q. Any gouge on the walls there?

A. No, sir.

Q. Apart from this one which you have just last described, what is the size of the other stringers or seams,—knife blade seams or what?

A. All through the mine——

Q. I am speaking of this particular cross cut.

A. Oh, this particular cross cut. Well, I have already said that they extend the whole length of the cross cut.

Q. I know that you have. My question is apart from the one that you have particularly described, the largest one. What are the dimensions of the other little knife blade seams?

A. Well, they run from little knife blade seams up to ten or twelve inches, and where sometimes a lot of them come together they will form quite a body of quartz.

Q. You are quite familiar with the mines of this Tonopah District?

A. Yes.

Q. Don't you think that almost anywhere in the lode trachyte away long distances from any vein, you will find little quartz seams almost anywhere?

A. There are large areas where you can go for a long distance without finding any quartz seams.

Q. Do you not find them very long distances from any known vein, in the lode trachyte throughout the district—little seams of quartz?

A. Little seams of quartz, yes. Most generally they are
805 near the larger veins.

Q. And seams an inch or more in thickness?

A. Yes.

Q. And you think that lying above—or rather do you think that lying above the 488 and the A series of raises in hanging country there were stringers such as you have referred to, that have been cut off by that fault, by the Siebert fault?

A. Yes.

Q. Did you make any effort to determine that—whether that was so or not?

A. Well, I was unable to determine the real throw of the fault and would hardly know where to look for them.

Q. There was nothing to evidence any throw of the fault there was there, where it is disclosed in those raises?

A. Not in those raises, no sir, that is any throw that you could measure.

Q. If you believe that there may have been stringers in the hanging country overlying the roof or clay gouge of this fault, do you also believe that they would be found in the foot country beneath those raises?

A. In the foot country?

Q. Beneath those raises?

A. I think so.

Q. If so they would not have been cut off by the Siebert fault?

A. No, sir,—still in place in the trachyte.

Q. Did you make any effort to find if they were there or not?

A. We did not do any work particularly, there is development which was already done, which proved that there are stringers in there.

Q. Where between raises 2-A and 7-A do you find stringers under the raises?

A. For instance in this raise here.

Mr. Lindley: Name the raise and put it in the record. You cannot tell in the record what it is.

806 A. Numbered as raise 418.

Mr. Dickson:

Q. Now point to it on the model, Mr. Siebert.

A. (Indicating.)

Q. Anywhere else?

A. This connection going up to 5-A which has been used as an ore chute, exhibits the same conditions.

Q. Anywhere else?

A. Raise 429-B.

Q. Well, that is above not below it.

A. I thought you said below.

Q. Yes. What do you have there in that raise?

A. That is a stringer section.

Q. How thick is the stringer section, knife blade?

A. No, sir. I think that the thickest quartz to be found in that raise is about two feet.

Q. There is one stringer?

A. Only one indicated there, but there is another that I do remember there, making a course like that (indicating).

Q. The one that is not indicated here, have you noticed the thickness of that?

A. The one that is not indicated is very clearly defined, and it is probably a foot wide on northern side of the raise and a few inches wide on the southern side of the raise.

807 Q. And what is the distance between the north and south side, a few feet?

A. Probably 6 feet.

Q. You have no note of it, you say?

A. No sir, just the ordinary size of the raise.

Q. Under 488 raise, between that and the south dipping stopes?

A. Yes sir, there is a very well marked stringer section.

Q. Where shown? In what line of work?

A. It is shown in connection from the top of 569 raise up to the 400 foot level directly underneath 488 raise.

Q. That is right at the bottom of the raise, isn't it?

A. I say up to the bottom.

Q. I mean from the bottom of the raise to the top, between that and the southerly dipping stopes. There is no work to show whether you had any stringers or not?

A. Excepting that we can see them going up in the hanging wall of that raise 569.

Q. Suppose you had extended from the easterly end to the westerly end of the crest of this fold, so far as depicted upon the model, raises every few feet, with same disclosures and for the same distances as you find in 4 A, 5 A, 7 A and 488 raises. You would still, I take it, be of the opinion that that upper terminal edge was

not the top of the vein, but those were mere stringers that had gone up into the hanging country?

A. I would.

Q. You would?

A. Yes sir.

Q. Although at the tops of each of them you had quartz in places carrying values for a thickness of at least 2 feet?

808 A. I have not found any continuous body of quartz going up any of those raises.

Q. My question was if you had at intervals of a few feet, from what you call the west or east end of the crest of your anticlinal fold continuously to your westerly end of that fold, raises going up from 20 to 30, 40 or 50 feet above the top of the crest of the roll, and having in the tops of each quartz of 2 feet or more in thickness, carrying values, would it still be your opinion that the tops of those raises, the line along the top of those raises was not the top or terminal edge of any vein, but that was all referable to the stringers that had gone into the hanging wall above the true top which is the crest?

A. Assuming that such raises as you described were put up, and also assuming that lying parellel to the fault and extending along in its same plane was a body of solid quartz, 2 feet thick that carried values,——

Q. I do not mean necessarily commercial values, you understand?

A. I understand. I should say that it was a vein, but I do not find those conditions in the raises as at present developed.

Mr. Lindley: The question was not directed to what was shown in the raises. It is the condition on the crest of the anticline.

Mr. Dickson: Raises over the crest of the anticline.

Mr. Lindley: You said up raises that — put along above the anticline into the hanging country and disclosed these veins, where would the top of that vein be? I did not understand you to say that you were confining your question to the raises.

809 The Witness: He said such raises——

Mr. Lindley: You said vertical raises.

Mr. Dickson: I did not say to the hanging country. I say our contention is these raises do not go up into the hanging country. My question was if at intervals of every few feet, 4 or 5 feet, starting at the easterly end of the crest and continuing to the westerly end of the crest, you had raises going up 20 or 30, 40 or 50 feet and at the top of each of those raises you had quartz 2 feet in thickness, whether he would, in his opinion, say that the line connecting the tops of those raises in this quartz carrying value was not the top of this vein?

Mr. Lindley: Well, I did not misconstrue your question. The points from where these raises were to be run was not specified.

Mr. Dickson: I said at intervals of every few feet.

Mr. Lindley: From where, and running where?

Mr. Dickson: From the east end.

Mr. Lindley: Parelleling A raises?

Mr. Dickson: From the east end to the west end, starting from the crest of the fold.

Mr. Lindley: The witness started to tell you what was in the fault plane. I do not think the witness understood your question because he was taking the conditions in the A raises and a work starting from raises run over the crest of the fold.

Mr. Dickson: Well, I do not think my cross examination is subject to any criticism.

Mr. Lindley: I take it that the answer of the witness was
810 not responsive to the question.

Mr. Dickson: Well, put it this way:

Q. We will suppose that at intervals of 10 feet from the east end to the west end of what you call, and -long what you call the crest of the anticlinal fold we had raises such as 488, and the other raises that have been put up, the A series, and that we had quartz up each of those raises, and say they extended, some of them 20 feet, some 40, some 50 feet and at the top of each you had quartz in place, a foot or 2 feet in thickness, carrying values, would you still be of the opinion, or would you be of the opinion that all of those raises and all of the quartz disclosed in such a series of raises was to be accounted for by stringers that had made up into the hanging country above the true hanging wall of this anticlinal vein?

A. Assuming, as I said before, that the quartz were solid, and assuming that it had a well defined dip and strike and walls, I should assume that it was a vein; I should think it were a vein. But I do not find such conditions in the raise which you have driven.

Q. You are answering upon an assumption that I have not requested you to make. We will suppose that each one of the series of raises that I have referred to you had what you call your Siebert Fault, just lying above the top of them. Would you then be of the opinion that all the ore found in those raises was to be accounted for as stringers in the hanging wall country above the true hanging wall of your vein?

A. Would you read that question, please.

(The reporter read the question.)

811 A. In answering the last question, I assumed for the sake of answering your question that the Siebert fault was a hanging wall.

Q. Is that the only answer that you desire to give to the question?

A. Yes sir.

Q. Are you familiar, or have you ever been familiar with the—I will withdraw that question for the present. Coming to the westerly terminal edge, where you have your Fraction dacite breccia, how do you account for the presence of that breccia, being the flow from some voncanic eruption at some great distance——

Mr. Lindley: Well, I do not object to Counsel asking the question, but I did not go into the dynamics of this case with this witness.

Mr. Dickson: Well, I think you went far enough to entitle me in cross examination to ascertain what knowledge he has.

Mr. Lindley: Very well. I point out to the Court that I did not open this subject of dynamics or the genesis or the origin of these rocks. I did not consider—while I think he is perfectly qualified, and I think probably the gentleman will get some surprises if he continues his question, I want to say that I do not believe that it is proper cross examination.

Mr. Dickson: If it is not proper I do not want to be permitted to ask the question. The witness stated——

Mr. Lindley: With this explanation, I withdraw the suggestion. Go on.

Mr. Dickson: The witness stated that the cut-off there
812 was abrupt, but not so abrupt as it would be if cut off by an eruptive rock.

Mr. Lindley: No, by a fault. I do not object. I withdraw all the discussion, only I want the Court to understand that I did not put this witness on as a geological expert. Now, you can go ahead with your cross examination.

Mr. Dickson: Well, I do not know, if you did not put him on as a geological expert, I can not understand portions of the direct examination.

Mr. Lindley: All right. Go ahead. No quarrel between us.

Mr. Dickson:

(Q.) Have you any opinion as to the source from which what you call Fraction dacite breccia found at the westerly terminus of this vein was? From whence it came, how it found its present position?

A. I think it came from a volcanic neck or crater, the location of which I have no idea.

Q. And it was simply poured over the country?

A. I do not think it was poured over. I think it——

Q. Flowed over?

A. I think it is what is termed an explosive breccia and settled over in the form of ash or fragments.

Q. Therefore, if that were the true explanation, it would not break the vein?

A. No sir.

Q. The present appearance of the terminal edge of this vein, in your judgment, is due to the erosion of an ancient exposed surface before the breccia was deposited there?

A. Yes sir.

Q. Did I understand you to say you found vein quartz
813 imbedded in the breccia?

A. Yes sir.

Q. How far from the terminal edge?

A. I think at one point on the 300 foot level I found quite a good sized piece of quartz, about 30 feet from the termination of the vein. On the west end of the 300 foot level, I found quite a large piece of vein quartz imbedded in the Fraction dacite breccia.

Q. Did it resemble the vein quartz that you have in this vein?

A. It was exactly similar.

Q. And was it imbedded in breccia in this sense, that you had that breccia on top, sides, and bottom of it?

A. Yes sir, all around it.

Q. Did you find places along the westerly terminal edge where you had right at the edge, or within a foot or two of it, unoxidized ore?

A. I do not remember of any point where the ore is not oxidized.

Q. You heard the testimony of Mr. Finch as to where he found oxidation. I suppose you agree with him? I do not want to take time to go over the same thing with you.

A. Yes sir, I agree thoroughly with Mr. Finch in that.

Q. Are you familiar, or have you ever been with the Mizpah vein?

A. Oh, yes.

Q. To what depth are you familiar with it?

A. To as deep as it has ever been found, that is just above the 700 foot level.

Q. Does that vein crop to the surface?

814 A. Yes sir. Not through its whole extent, it doesn't.

Q. No, but any portion of it?

A. Yes, a great portion of it does.

Q. Do you not have in that vein, speaking generally, the ores and ore material, vein material oxidized, speaking generally throughout to a depth of 500 feet?

A. Yes sir, there was oxidation on the 500 foot level.

Q. Are you also acquainted with the Valley View vein?

A. Yes sir.

Q. To what depth?

A. I never mined it myself below about 340 feet, I think it was, although I saw the bottom of the vein where it terminates against the Siebert fault.

Q. That was the deepest working when you last visited it?

A. That was the deepest workings, yes.

Q. Now, are not the ores and vein material of that vein, speaking generally, completely oxidized to the greatest depth that the workings had attained when you were last in it?

A. They are not completely oxidized, no sir. They are oxidized in the seams and crevices, show signs of oxidation.

Q. Extensively oxidized?

A. In places.

Q. Quite as extensively oxidized as Siebert 3 and 4?

A. I think there are points on the 500 foot level of the Mizpah where the oxidation is quite as heavy as either one of them.

Q. Do you know whether the oxide of manganese, chloride of silver, horn silver, silver iodides and bromides are the product

815 or result of oxidation?

A. Generally speaking, they are, yes sir

Q. Do you not find in the Mizpah vein and in the Valley View vein to the greatest depths of the workings of either of those mines had attained when you last examined it, the oxide of manganese, chloride of silver, silver iodides and bromides?

A. Yes sir; I never mined on the Mizpah vein below the 500, e
cept we encountered it in the shaft.
Q. I say down to the depth that you are familiar with it?
A. To the lowest depths at which I ran levels, yes.
Q. You do find those metals?
A. I did.
Q. Those minerals. Do you find anywhere in the vein here i
controversy, and if so, where, similar minerals, that is to say, oxi
of manganese, chloride of silver, silver iodides, or bromides?
A. I have never seen any silver iodides or bromides in the We
End MacNamara vein. I have seen the oxide—manganese oxide
Q. Oxide of what?
A. The manganese oxides.
Q. At great depth, too, have you not?
A. The deepest portion of the mine, yes sir.
Q. What depth?
A. From 664 winze which vertically would be about 650 feet fro
the surface.
Q. Do you not find in the West End vein sulphides and carbo
ates, instead or oxides, chlorides, iodides and bromides?
816 A. The West End vein principally, you might say, wi
the exception of the western terminal edge is practically
sulphide ores.
Q. Have you been up in raises—withdraw that question. Ha
you any opinion, if you have not I do not wish to go into it—as
which was the older, the earliest cap rock of this vein?
A. The first cap rock?
Q. Yes?
A. Yes sir.
Q. What was it?
A. The midway andesite.
Q. The midway andesite?
A. Yes sir.
Q. Have you been up any of the raises from the underlyi
trachyte into the midway andesite?
A. Yes sir.
Q. Did you find in any of those raises at the contact between t
trachyte and the Midway andesite evidences of oxidation?
A. Very little.
Q. In direct examination, I understood you to say that the co
tact fissure vein—I want to know if it is correct—was northeasterl
Am I correct?
A. That the direction of the strike or dip or what?
Q. I understood you to say that the trend of the vein, the tre
of this vein was northeasterly?
A. Well, I said it in that way because the strike of the vein chan
so much, I said it simply had a northeasterly trend in order to g
you a general answer.
Q. Well, did you use the term "trend" in the sense of strike
course?
A. Not altogether, no sir.

817 Q. What did you mean by the trend of the vein was northeasterly?

A. Well, for instance, if you were to take up the general course of a vein on its strike from the southwestern corner looking out in this way, you would say that the trend of the vein was toward the northeast.

Q. Well, how near to a northeasterly course? Do you mean practically northeast?

A. No sir.

Q. What do you mean?

A. That is the trend of its greatest extent, so far as I know.

Q. Well, what do you mean by trend?

A. I do not mean strike altogether.

Q. Well, what do you mean?

A. Now, for instance, if you have a large——

Q. By the trend of a vein, as distinguished from the strike of a vein? I simply want to get at——

A. I am sorry I was not more definite. If you wish to ask me about the strike——

Q. No, I ask you what you mean, what you had in mind when you answered that the trend of this vein was northeasterly?

A. I had in mind principally that its dip was southeasterly, and that its trend, or what you might call its strike was in a general northeasterly direction.

Q. Do you mean by that approximately northeast?

A. I said generally northeast; approximately northeast. I see now that I should have said northerly, but it doesn't make any difference.

818 Q. You should have said north 15 west, or thereabouts, instead of northeasterly?

A. North 15 west?

Q. What?

A. If you want me to give you the strike of the vein as I consider it at any point, I would be glad to figure it out, but I haven't got it in my mind just now.

Q. What is, in your judgment, the trend of this vein? What is the direction of its trend?

A. The strike?

Q. In the same sense that you used the word, its trend was northeasterly? In the same sense that you used the word *Q*trend" there?

A. I would say that its trend from the south side line of the Eureka claim to a point about 300 feet northerly from the north side line of the West End claim, that it is a northerly direction or trend.

Q. How near north and south, and how far from northeasterly?

A. It would be almost due north and south.

Q. Almost due north and south. It would be a little west of north, wouldn't it? About 15 degrees west of north?

A. That is, if you are going to take in a point beyond the one which I have mentioned, it would.

819 Q. Do I understand Mr. Siebert, that your opinion is that

westerly from what is marked Plaintiff's exhibit-2, the Corkhill shaft, and on our model the West End shaft——

A. Yes.

Q. That westerly from that, to the westerly terminal or termination of this vein, that you have on the north dipping leg, a contact between rhyolite and trachyte, and on the south dipping leg you have a fissure vein in the homogeneous trachyte.

A. You are correct as to my understanding *as* regard to the south dipping vein, and on a section that is about on a line with our section 12—which is at this point——

Q. Which point?

A. Along the plane of this section.

Mr. Lindley: Section 12 is up back of the Judge there?

A. Yes. There is some West End rhyolite in the foot wall of the vein at the northern end of that section.

Mr. Dickson: You mean that it is your opinion that this contact on the north dipping branch between the rhyolite and trachyte is local, west of the West End or Corkhill shaft?

A. Yes, at this point which I indicate on section 12. As you go further east in the ground you find that in sections of ours, from say three to eight inclusive, would show a contact of West End Rhyolite with Mizpah Trachyte.

Mr. Lindley: On both sides of the anticline?

A. On both sides of the anticline.

Mr. Dickson: Let me read to you. "Q. Well, now what is this contact; is it the same throughout the entire mine, that is the overlying mineral rock is the same, or is there a change in the contact rock?

A. There are several changes in the contact."

820 A. Yes, sir.

Q. "Just generally describe the different kinds of contact in which the vein lies? A. Toward the eastern portion of the West End mine the contact is between Mizpah trachyte and glassy trachyte, the Mizpah trachyte forming the hanging wall, and the glassy trachyte the foot wall. That condition only exists for about 175 feet westerly from the east end line, and beyond that the contact is formed between Mizpah trachyte and West End rhyolite. Q. This condition exists some little distance west of the Corkhill shaft. A. Well, the vein becomes a fissure in the Mizpah trachyte except on its northern dip, and in the MacNamara ground it continues to be a contact between West End Rhyolite and West End Rhyolite"—I suppose that you meant that to be Mizpah trachyte? "The vein just a little beyond the Corkhill shaft,—the vein becomes a fissure in the Mizpah trachyte except on its northern dip in the MacNamara ground it continues to be contact between the West End Rhyolite and West End Rhyolite." That is not what you mean?

A. I said that it continued to be in the northwestern portion of the MacNamara,——

Q. Now, we will substitute the word- "Mizpah trachyte" for "West End Rhyolite." Now, speaking of just a little distance west of the Corkhill shaft,—the vein becomes a fissure in the Mizpah trachyte except on its northern dip, and in the MacNamara ground it con-

tinues to be contact between West End Rhyolite and the Mizpah trachyte, until a-most its western terminus, as far as developed?

A. They left out two words of my answer judge, I am quite sure.

Q. What words?

A. A few words, the words "northwestern portion of the
821 MacNamara stopes."

Q. I made a note of it and asked to have that portion of the testimony, and my note of it was in accordance with the transcript, except the words "West End rhyolite" was used, at least once, when the words "Mizpah Trachyte" should have been used.

A. That is not what I intended to say.

Mr. Lindley: Well, the witness says that is not what he intended to say.

Mr. Dickson: Well, I will give him a chance to correct it. If you testified as I now read, what correction do you wish to make of it, speaking now of the point a little west of the Corkhill shaft,—the vein becomes a fissure in the Mizpah trachyte.

A. That is correct.

Q. "Except on its northern dip in the MacNamara ground it continues to be contact between West End Rhyolite and West End Rhyolite until almost to its western terminus, as far as developed." "I might add that at other points locally, due to faulting or erosion that at times the Midway andesite or the Fraction dacite breccia may rest directly on the vein."—if you did not mean to so testify what corrections do you desire to make?

A. I desire to make the correction that the contact between the Mizpah trachyte and the West End Rhyolite, exists from the point I indicated, which is 175 feet east of the east end line of the West End claim, to a short distance beyond the Corkhill shaft, where it becomes a fissure in the Mizpah trachyte with the exception of the northwestern portion of the north dipping limb of the anticline, where it is a contact of West End Rhyolite and Mizpah trachyte, almost to its—almost as far as it has been developed,—and
822 again in its most northwestern portion becomes a fissure in the Mizpah trachyte.

At this time a recess was declared until three fifty P. M. December 17th, 1914.

After Recess, Three fifty-five p. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

FRED J. SIEBERT on the stand for further cross-examination.

Mr. Dickson:

Q. Only a few more questions. Do you know Mr. Siebert where section-13, Plaintiff's exhibit-3 was passed, where it was taken? Do you know that section of the country?

A. Yes.
Q. Just stand so that his Honor can see.

Mr. Lindley: The section line is marked on the bottom of the model.
Mr. Dickson: Yes, I know that they are.

A. This section line-13—followed a north and south line.
Q. Where that plane of section is taken, do you know that on the northerly dipping leg of your anticlinal fold, and near where I now point, where the stope is shown turning up towards the surface, whether there was a series of faults there, some of them faul-ing that vein in that locality?
A. Yes.
Q. Some of them reversed and some of them normal faults apparently?
A. Yes.
823 Q. That is true is it?
A. That is true.
Q. And to reconstruct the vein at that place, in that particular vicinity, and so as to have it as it was before the faulting occurred, one would have to know whether any one of the series of faults was a normal or a reverse fault, and would have to know also the extent of displacement of each of them?
A. Yes, sir.
Q. I call your attention to a stope marked 19 on Plaintiff's Exhibit-2?
A. Yes, sir.
Q. Does that in your judgment represent an anticlinal fold, tending to show the anticlinal habit of this vein?
A. It does.
Q. That ore body is not on a contact between different rocks is it?
A. It is wholly within the Mizpah trachyte.
Q. It is in a fissure?
A. In a fissure, yes, sir.
Q. What do you mean by the word "tangent" as you have used it here, that this Siebert fault was tangent to the crest of this roll? What is your understanding of the word "tangent"?
A. We have an anticlinal fold like that for instance, and the Siebert fault being a straight line is tangent to it, about in that position (indicating).
Q. A tangent would be only along a line a mathematical line, would it, just where it would touch the circle?
A. It would be along the plane.

Mr. Lindley: Not a line, a plane.
Mr. Dickson: I do not so understand, a tangent of a circle would be just where it would touch its circumference. I just wanted
824 to get the witnesse's idea about it; in what sense he used it.

Q. When did you first come to the conclusion that the trend of trend of this vein was not northeast but somewhat west of north?

A. Well, I think I might say that that was really a mis-statement on my part this morning.

Q. What was a mis-statement?

A. In saying that the trend was northeast. I was thinking more particularly of its dip being towards the southeast, and thinking of its trend or strike as being at right angles, and for the moment I forgot the Ohio workings.

Q. Have you spoken with anybody since you went off the stand this last recess about that? Or has anybody spoken to you about it?

A. No, sir, I do not think so.

Q. You would surely remember if during the past twenty minutes anybody spoke to you about that, or you had spoken——

A. No, sir.

Q. When, then, did you first come to the conclusion or form the opinion that the strike of this vein was practically due north and south?

A. The portion I have mention- to you as being from the extreme end of the West End of the 600 foot level to the point which I mentioned to you as being about 300 feet in a northerly direction, or more nearly 200 feet in a northerly direction from the north side line of the West End claim, is almost due north of south. And from that point in the MacNamara ground to the extreme western edge of the vein, so far as developed in this territory, which is beyond the edge of this model, I should say that the strike is more nearly
825 northwest.

Q. And you are referring now to that portion of the vein upon which I lay the pointer?

Mr. Lindley: No he is referring to that portion of the vein which is not on the model.

The Witness: Also to this portion of the vein. (Indicating.)

Mr. Dickson: Lay the pointer where you want it.

A. I would say from this point here to a point about in here, just as far as the vein has been developed, it is more nearly northwest. (Indicating.)

Q. Where do you deflect the strike, point out on the model—from a north and south strike to a northwesterly strike? At what point on the model?

A. It would be about the point where I have my pointer. There are no numbers in the immediate vicinity to locate it.

Q. Point to it up here.

A. I did, right here, (indicating).

Q. What point would that be on the model, on Plaintiff's Exhibit-1?

A. You might call that the upper northeast corner of stope 9-A, as marked on Plaintiff's Exhibit-2.

Q. From thence southerly what was the strike of your vein?

A. Almost due north and south.

Q. What deflects the vein in its strike at the place where it evidently has been deflected, according to your opinion?

A. Evidently erosion.

Q. The erosion has changed the strike of the vein?

A. Has changed the shape of the out crop.

826 A. I was speaking about the strike, you make a distinction, do you not Mr. Siebert, between the direction of the outcrop of a vein and its strike?

A. Yes, sir.

Q. Well now what is the strike of the vein as distinguished from the direction of the outcrop?

A. The strike on any one level in the northerly dipping vein——

Q. Is about what?

A. Just below that point (indicating)——

Q. What?

A. Just below the point which I indicated before, would be approximately North sixty west.

Q. Lay two rulers if one is not long enough, two of these pointers, on the north dipping vein from the easterly terminus of stope-12, to the most westerly stopeing shown on the north dipping vein, of the line that in your judgment is the strike of the vein—the north dipping branch of the vein.

Mr. Lindley: The local strike on that level?

Mr. Dickson: The true strike.

A. Well, it represents really a curve,—a curved line. If you want to connect the two ends and take the strike in that way.

Q. Well, I do not want to take it any way. I want you to indicate by the pointers, and then state to the court what you believe the strike of the vein to be throughout that distance? At about where you have it—where you desire it.

A. Yes, sir.

Q. And about what is the course of that line?

A. From the edge of stope-12 to a point in stope 8——

Q. The easterly edge?

A. From the easterly edge of stope-12 to a point in stope-8—about where the figure 8 is upon this model——

827 Q. Figure eight in the stope you mean?

A. Yes, sir. I should say that the strike was about north fifty west, and from the figure eight upon the model to the westerly edge of the model, the strike would be about north sixty-five or seventy west.

Mr. Dickson: That is all.

Redirect examination.

Mr. Lindley:

Q. Mr. Siebert, are there any parts of this mine on the north and south dipping vein, in the same plane and same section, which follows a plane of contact from the south to the north dipping vein?

A. You mean forming a contact all the way over?

Q. Where the vein follows a plane of contact on both sides, which is the same?

A. Yes, sir.

Q. Where is that shown on what section?

A. That would show on sections, 1, 2, 3. 4, 5, 6, 7, 8, and if my memory is right, also 9.

Q. Take a typical cross section and explain that, or sections? Show where the contact on the north dipping side of the crest of the anticline is the same contact over on the other side. I want sections that show that clearly.

A. Most any of them will show it clearly.

Q. Now, put them up there and let us see what it is? What are you referring to now.

A. I am referring to section one.

Q. Marked Finch-what?

A. Marked "Finch-4."

828 Q. I will ask you whether or no the plane of contact on the north side of this fissure, is the same on the south side, and whether that contact continues over what you call the anticlinal-roll?

A. It does.

Q. Proceed with the next section?

A. I might remark in section one that this contact is glassy trachyte in the foot wall and Mizpah trachyte in the hanging wall.

Q. Well, now, go on to the different contacts, just exhibit the sections there, to show the idea that the contact is the same on both sides.

A. This is section-2 marked Finch-3. In this section we find that the foot wall is West End rhyolite, for its entire length and the hanging wall is Mizpah trachyte for its entire length.

Q. Over on each side of the anticlinal fold?

A. Yes, sir. On section three we find the same condition existing as on section two. I think the artist has scattered a little too much pink paint here, but this is all West End rhyolite throughout that section and underlying both limbs of the anticline.

Q. Is the contact the same on both sides of the crest of the anticline?

A. Yes, sir, with one exception.

Q. And that is where?

A. That is where the Siebert Fault—no there is no exception there. I thought there was a small segment where the Mizpah trachyte——

Q. In other words we have the contact on both sides which the vein follows?

A. Yes, sir.

Q. Any other section?

Mr. Dickson: May I ask what is the underlying?

Mr. Lindley: You may, yes sir. You may ask anything you want.

829 A. West End rhyolite. Section-4, which is also marked "Siebert-1" shows the same conditions except for a short distance immediately over the raise 294 where the Midway andesite has been brought directly over the Siebert fault, and directly over the vein.

However, going towards the north we find the Mizpah trachyte is again in place in the hanging wall, where it has not been disturbed. We also find that all of the south dipping portion of the roli is covered over by the Mizpah trachyte, and that all of the foot wall on both slopes, is West End rhyolite.

Mr. Dickson: That is section-4?

A. Section-4.

Mr. Lindley: Go on with your successive sections there.

A. That same condition exists in section five which is also marked Finch-6. There is also a little scoring by the Siebert Fault at that point where the Midway andesite is only separated from the vein by the Siebert fault.

Section seven, represents the same condition. The Mizpah trachyte in the hanging wall of the south dipping limb and the Mizpah trachyte overlying the vein on the north dipping limb with the exception of one point where the fault is again tangent to the vein, with the Midway andesite directly over it.

830 Mr. Lindley:

(Q.) How about the foot wall?

A. The foot wall is west end rhyolite throughout. I missed section 6; I will go back to it now. The same conditions exist on Section 6. We can find at one point the Siebert fault immediately overlying the vein, and the Midway andesite over that. But at all other points on both the north and south dip, the Mizpah trachyte forms the hanging wall, and at all points underneath the west end rhyolite forms the foot wall.

On Section 8, the conditions are again the same, with the Mizpah trachyte forming the hanging wall of both the north and south dipping limbs of the anticline, except at one point again where the scoring of the Siebert fault has brought in the Midway andesite. The West End rhyolite forming the foot wall throughout the whole length of the section.

Q. Now, Mr. Siebert, with reference to faults, you have described this Siebert fault, and you have also stated in response to a suggestion from Counsel, or a question from Counsel for the Defendant, that there are numerous faults in the mine. Is there any other fault in the mine shown in any of these workings that is of the same dignity as to size as the Siebert fault?

A. Not that I know of.

Q. Compared to the Siebert fault, how do you classify these other faults that you have mentioned in response to the questions of Counsel?

A. I regard the Siebert fault as younger than any other fault in the mine.

Q. How as to its proportions, as to its major or minor

831 quality?

A. It is essentially a major fault.

Q. These other faults that you spoke of that have faulted the vein in different parts of the mine, are they major or minor faults, taking the Siebert fault as a standard?

A. They are minor faults.

Q. You spoke of the—I understood you to testify in reference to this oxidation that shows on the vein in contact with the Fraction dacite breccia at *h*the west end, and if I remember your testimony correctly, that that oxidation extended or was shown in the drift some distance beyond the point of contact of the vein with the Fraction dacite breccia?

A. Yes, sir.

Q. What determines the distance to which a vein may be—which is exposed at the surface—may be oxidized below the surface?

A. Depends primarily on how much fracturing has taken place in the vein, in connection with the length of its exposure to the surface.

832 Q. In other words, a vein that has been exposed for a very very long time may be oxidized to some considerable extent below the surface, or beyond the surface, whereas, a vein that has not been exposed for a great period of time would have a lesser oxidation in the vein from the surface down?

A. Yes. I forgot to mention in that regard that there is a third element also, and that is the rapidity with which erosion might have taken place, whether it kept in step with the oxidation of the vein or whether the erosion was very light.

Q. Well, with reference to the Mizpah and Valley View veins, are those veins of the same period as this vein?

A. No, sir.

Q. To what period do they belong with reference to this vein?

A. They are very much older.

Q. They are of a very much older period?

A. Yes.

Q. How do you account, if you can account very rationally, for the extent of oxidation shown in the Mizpah and Valley View veins and the much lesser extent shown in the vein in question?

A. I presume that it has been exposed for much longer, being a much older vein, and possibly the shattering on Mizpah Hill has been greater along the plane of the vein, allowing the circulation of surface water to great depth. Then, on the other hand, the West End-MacNamara vein is not only younger, but has been covered.

Q. Covered with what?

A. Mizpah trachyte.

Q. Does that, in your judgment, account for the difference in depth of oxidation shown in one series of veins that is not shown in the other?

A. Yes.

833 Q. In other words, as soon as the Fraction dacite breccia covered up the apex, oxidation ceased?

A. I think it did. It might have gone on to a minor extent.

Mr. Lindley: That is all.

Recross-examination by Mr. Dickson:

Q. From what data do you conclude that the Mizpah and Valley View veins are much older than this vein under discussion?

A. I have drawn that conclusion principally through reading the works of Mr. Spurr.

Q. That is what I supposed. Not from your own observation?

A. No sir. I have always believed that that was the case and I have deduced it for myself.

Q. If it had not been for what you had read in these reports and monographs of Mr. Spurr would you have been prepared to say that the Mizpah and Valley View veins were very much older than the vein here under investigation?

A. They seem to be of very different character and different age.

Q. How is that?

A. They seem to be of very different character and different age, and I could form my own opinion as to the fact that they were of different age on account of their different character.

Q. Independently of,——

A. Independently, but to place the relative age, I don't believe I could do it myself.

Q. And independently, however, of what Mr. Spurr has said and you have read, you would not be of the opinion that the
834 Valley View and Mizpah veins were of a different age than the one here under investigation?

A. That is my belief.

Q. And in your opinion, to the best of your mind, and from what you have read of the writings of Mr. Spurr, in your opinion which would be the oldest of the three, and upon what would you base that opinion?

A. I have never thought enough about it to base an opinion of that sort.

Q. You would not have an opinion as to which was the oldest?

A. I think I would.

Q. Upon what would you base it,—the extent of the oxidation?

A. That would be one way, yes.

Q. What else?

A. The relative positions of the rocks in which they are contained.

Q. And the Mizpah vein is found in this same trachyte?

A. The Mizpah vein is a fissure in the trachyte wholly.

Q. In the same trachyte?

A. In the same trachyte, yes.

Q. And the Valley View, also?

A. The Valley View also.

Q. The depth to which oxidation may be extended will depend upon not only the fractured, broken condition of the rocks enclosing the vein, especially the hanging-wall or upper side of the vein, but its porosity as well as fracturing; porosity that would permit surface waters to percolate down through it, and that the underlying ores would set up a process of oxidation?

A. Yes, it might be.

835 Q. This vein under investigation,—the enclosing wall rocks are very much faulted and broken, aren't they?

A. There are numerous faults, but not so many as on Mizpah Hill.

Q. Here we have many other faults,—the famous Siebert fault,

which is exposed clear through to the surface, cutting all of the cap-rocks?

A. Yes.

Q. And I suppose there are sympathetic fractures from place to place, sympathetic with the Siebert fault, from its top to bottom?

A. Yes sir.

Q. Do you know a fault called the Edwards fault?

A. I know the fault and I first heard it mentioned by that name since the trial began.

Q. Well, apart from the name, you know the fault that has been referred to as the Edwards fault?

A. I do.

Q. Has there not been great displacement on the plane of that fault?

A. Apparently very little displacement.

Q. Very little?

A. Yes.

Q. Hasn't it thrown the vein,—deflected it from its course?

A. Yes, a little bit.

Q. About where is the Edwards fault disclosed on the 500-level of the West End, and give its direction, if you can. Point to the place now,—you are referring now to Defendant's Exhibit "E"; Give us the station.

A. As the fault is disclosed on Defendant's Exhibit "E,"
836 passes across the south side-line of the West End claim at a point near station 1062, and continues in a northeasterly direction, dipping toward the southeast at varying angles, through station D. 1154 in drift 501, follows this drift in the same direction and passes about through station 1157.

Q. Well, I think that will be sufficient. Now do you think that the Edwards fault has played no part in the apparent deflection of the course of the vein in that level?

A. I think it has.

Q. Put up Section 4 for a moment.

A. Our Section 4?

Q. Yes, your Section 4. I don't know whether I have anything to ask on it or not; I couldn't see the colors very well. (Witness produces Section 4.) Will you put up Section 13.

A. Section 13?

Q. Yes, and get 12 and 11 while you are about it. (Witness producing sections.) You have Section 11 now on the easel, or table?

A. Yes sir.

Q. And the foot-wall and hanging-wall country of the north dipping and south dipping veins there, is what?

A. Mizpah trachyte, with the exception of slight scoring here by the Siebert fault, where the Midway andesite comes in and erosion here that brings the Fraction dacite breccia down to the hanging wall.

Q. The same rock underlying and overhanging the veins throughout?

A. Yes sir.

Q. And that is true also with Sections 12 and 13, is it not?
A. Yes, I think it is, with the exception that I pointed out to you this morning on 12.
Q. That little local,——
A. Yes, with the exception of this.

Mr. Dickson: That is all.
Mr. Lindley: That is all.

The Court: This case is continued until tomorrow at 10 A. M.

837 18.

December 18, 1914—ten o'clock a. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Cmpany.
Mr. Lindley: Mr. Bradshaw, take the stand.

Testimony of FREDERICK BRADSHAW, who being called and sworn as a witness on behalf of the Plaintiff, testified as follows, to wit.

Direct examination.

Mr. Lindley:

Q. Mr. Bradshaw, what is your full name?
A. Frederick Bradshaw.
Q. Where do you reside?
A. Tonopah.
Q. What is your occupation?
A. Mine Manager.
Q. How long have you been engaged in the mining business?
A. Eighteen years.
Q. In what capacities and where?
A. The first four years of my mining experience I was an assayer and mine surveyor and engineer of construction of various mines in Arizona and South Dakota. In 1909, I first took charge of a property as superintendent, that being the Sunset Mining Company near Terry, South Dakota. I stayed in that position until
838 January 1900 when I took charge of the Gordon Tiger Mines in Lake County Colorado, I lived there until the latter part of 1901, and then went to Mexico as manager of the Santo Domingo Mines, at Batopolias, Chihuahua. I stayed in this position until May 1909, when I returned to the States.

I took a position as General Superintendent of the Tonopah Belmont in Tonopah on January 1st, 1910. Shortly after this I was made general Superintendent of the Jim Butler Tonopah Mining Company, and have since held that position.

Q. Mr. Bradshaw, when did you first acquire information as to the workings of the West End,—extension of the West End workings underneath the surface of the Jim Butler property?
A. I first acquired positive information early in January, 1914. I had previously tried to get information as to the workings——

Mr. Dickson: How is this material?

Mr. Lindley: I simply want to show that the works of the Jim Butler were not connected with the West End Company.

Mr. Dickson: That will be admitted.

Mr. Lindley: Well, that may be admitted then that these works were not connected, until after the suit——

The Witness: Until January 27th, 1914.

Q. January 27th, 1914?

A. Yes, sir.

Q. And at that time the works of the West End company had been extended underneath the surface of the——

A. Yes, sir, at that time workings of the Jim Butler company broke into the workngs of the West End company.

Q. Now, Mr. Bradshaw you are familiar with the controversy in this case, over the section of the mines, the MacNamara and the West End, where the vein changes its dip from a south to a north direction?

A. I am.

839 Q. And that the controversy in this case, at least one controversy in this case, is the question as to whether the north dipping ledge and the south dipping ledge, constitute one or two veins? You understand that situation?

A. Yes, sir.

Q. Are you familiar with the vein exposures shown in the underground works of the companies, along what we call the top or crest of the anticline?

A. Yes, sir.

Q. I wish you would explain to the court what that condition is and what it discloses as to whether there is one vein or not? Proceed in your own way and state what the conditions are and the reasons for your deductions?

A. I believe the vein in question to be but one vein, this vein is throughout the very much larger proportion of its area a contact vein. In the western portion of the workings it locally is not a contact vein, but has both walls in the Mizpah trachyte. I believe however, that the roll of the vein is simply a dome-shaped anticline, and that there are not two veins in this section or in any section.

Mr. Lindley: Take the witness.

Mr. Dickson: No questions.

Mr. Lindley: One moment. That is all Mr. Bradshaw. Oh, those photographs, identify those photographs that were introduced in connection with Mr. Wiley's testimony.

Mr. Colby: Wiley X, 1 & 2.

Mr. Lindley: Two photographs taken by Mr. Bradshaw.

Q. Your attention is now called to two photographs marked respectively "Wiley X-1" and "Wiley X-2" do you identify those photographs?

A. I do.

Q. Who took them?

A. I took them, with the assistance of Mr. Searls.

840 Q. Are you accustomed to the use of a camera?
A. Somewhat, yes sir.
Q. And will you state the different points at which those photographs were taken, referring to them by the exhibits?
A. Yes, sir. The Wiley X-1,—the photograph marked "Wiley X-1" was taken at the bottom of the 200-A raise, the raise which has been called by the name "A" by the West End Company, and the camera was pointed north forty five east.
This was—the camera was in the MacNamara stope, and the view embraced the south dipping and north dipping portions of the stope.
The photograph marked "Wiley X-2" was taken in the Jim Butler property at a point in the 721 drift. The camera was pointed just about west and shows a small anticline in the Jim Butler workings.

Mr. Lindley: That is all.

Cross-examination.

Mr. Dickson:

Q. I did not hear just where Wiley X-2 was taken?
A. It was taken in the Jim Butler workings from a point in the drift 721. The camera was pointed just about due west.

Mr. Dickson:

Q. His Honor visited those places?

Mr. Lindley: Yes.
Mr. Dickson: No cross.

841 Testimony of CLYDE JACKSON, being called and sworn as a witness on behalf of the plaintiff, testified as follows, to wit:

Direct examination.

Mr. Lindley:

Q. Mr. Jackson, what is your occupation?
A. Miner.
Q. How long have you been engaged as a miner?
A. Well, I started as a miner in 1890, for myself, but there has been four or five years during that time that I have not been actively engaged in mining. I was actively engaged in mining all of the time until after I came to Tonopah in 1901, but since that time I was in the promotion business for a while, that is connected with mining, but not actively engaged as a miner.

The Court:

Q. How do you want your name to appear in the record?
A. Clyde Jackson.

Mr. Lindley:

Q. To what extent have you actively worked in mines?
A. Well, up to the time——

Q. Give us the number of years?
A. Well, it has been very much broken, Judge. I have been as-ayer and sometimes working in the mill, but most of the time I ave been working underground. My mining experience has been ostly underground.
Q. Well, how many years have you spent working in mines underground?
42 A. Well, I would say without haveing figured it out exactly I would say perhaps twelve years, judge.
Q. Where have you worked?
A. I have worked in Candelaria, Nevada, and in Sonora, Mexico, nd Ely, Nevada, and Parks City, Utah, and various places in Cali-ornia, mostly on the mother lode nearly six years along the mother ode in California, and I was in Alaska for a while, but I was in lacer mining there.
Q. How long have you been working in the mines in Tonopah?
A. As an underground miner less than two years. Since Febru-ry of 1913.
Q. What mines have you worked in here?
A. The North Star, West End and the Golden Crown, and the Jim Butler, and before that I was working as Superintendant of pros-ects here in town, the California shaft. I was at the California haft for a while but that was several years ago.
Q. Are you familiar with the vein that is shown in the workings f the West End—MacNamara, that has been worked upon in the tope?
A. Why, a portion of it, judge.
Q. Are you familiar with what we call the top of the anticline?
A. Yes.
Q. Where the vein changes its dip from the south?
A. Yes.
Q. Have you made a close inspection of that section of the mine?
A. Fairly so, yes.
Q. Well, now, I want you to describe what that situation is there, long the crest of that anticline, testify as to what you see, and what our deductions from what you see at that raise and the stopes—such topes and raises, as you may select for that purpose. Are you fa-miliar with this model?
43 A. Why, no. I have seen the model before it came into the Court room but it was not complete. I have looked at it several times here.
Q. Are you familiar with the names of the raises?
A. I know the names of the raises and the top of the anticline.
Q. You may start in, if you please, describing the condition from he cres- of this roll, commencing either at the east or west end which-ver you see fit, and follow it through and explain what the appear-ances are, and what you find there?
A. Starting at the east end of the West End claim you follow up he stope in several raises there, the most easterly one is the 569 I believe, and you can follow the quartz the same as it is in the stopes, where it has not been stoped there, up to a point which is the top of

the anticline, and there a turning over, taking a northerly slope or dip for some distance, this quartz is all solid, continuous quartz.

Q. Is there one or more veins at that point?

A. There is but one vein. There is a little branching out of the hanging wall; the main body of the ore though, the main vein continues right over, and in fact where the branches above—the upper branch leaves, and then it practically comes together again on the northerly dip.

Q. Well, now, where next do you find this exposure?

A. The next raise west of that is practically the same thing, the vein—you can go up out of the stope through that raise 571, and continue over the top of the anticline, following the quartz in the vein continuously, over and on the northerly slope.

Q. And the next exposure?

A. The next the 573 Raise, the same thing can be said practically of that as of the others, and the glancing of the vein,—small
844 branch going up above the lower branch, but it has a top or apex at about the same point where the lower one does, and also slopes northerly.

Q. You say the top or apex——

A. Not the apex—the top of the anticline or roll where it starts from the southerly slope to a northerly slope.

Q. And do I understand you to say that that was so strand also?

A. Yes, sir.

Q. They both pursue the same course?

A. Yes, sir.

Q. Have you any notes upon that subject?

A. No, sir. I made a little sketch—I have no notes.

Q. Made sketches when underground?

A. Underground without measurement at all, just from my eye and alone.

Q. There will be no objection I presume to you referring to these at point you wish to?

A. I would like to refresh my memory on them if I cannot remember exactly.

Q. You may do so. Whenever it is necessary for you to refresh your memory you may be permitted to do so.

A. Yes. The upper branch where it separates here, does come over and join the lower branch on its northerly dip, in about the same way.

Mr. Dickson: What raise is that?

A. Raise 573. Passing from there going still further west you can go along in some stopes there or go ahead and take the 400 level, which lays above the raise and the stopes underneath are not so extensive, and I think that they are stoped up to the top or crest of the anticline, and perhaps slightly over a little bit; that is on the under stratum or lower branch of the vein.

845 Mr. Lindley:

(Q.) Now, you may proceed, Mr. Jackson, with the next indication.

A. In going from the 573 raise further west, you can go either on the 400 level there, or there is a raise out of the end of this stope which takes you up to the 400 level at a point close to 485 raise, I think it is. I think that is it. It is not numbered there. It is the nose or where the vein is cut by the 400 level at a point in the top of the anticline. It would be right here (indicating). It is a little short raise, anyway.

From that point going west, the vein has been stoped for a considerable distance easterly and westerly along the course of the vein, and wherever it is—I should say there is two branches of the vein here, an upper and lower branch; I think they are marked "B" and "A" stope on the model, but going along on the B stope, there is a good many places where it is filled a good deal.

Mr. Dickson:

(Q.) Where? What?

A. Where it is filled, there is a good deal of filling, and in some places it is not so extensively stoped over on the northerly stope as it is on the southern—south slope. But wherever it is, where you have an opportunity to examine it, you find the same continuous quartz going up the southern slope and continuing on up a northern dip.

Mr. Lindley:

(Q.) Have you seen the works of the mine since A and B stopes have been connected?

A. Oh, through the 494 raise?

Q. I mean by raises, yes.

A. Yes.

846 Q. Well, then, what do you say with reference to conditions shown there?

A. That the quartz is continuous over the top of the anticline, from the south slope over and going down on the north slope.

Q. Well, is that the vein that continues from the south to the north?

A. Yes, sir.

Q. The same vein?

A. Yes sir.

Q. Now, you may proceed westerly with your explanation and go along in the route?

A. Well, I think that—as far as that portion there is concerned, it takes me on that lower main branch of the vein as far west as I can go there.

Q. Well, where do you next see the roll?

A. Going west, or I can go into the A stope, if you——

Q. Well, go on, take your own route; you are familiar with the underground workings in this section?

A. Well, the A stope is practically the same as the lower one, excepting the quartz is not so thick, it is smaller, and I find in placed where it can be seen that it joins the lower branch, especi-

ally on the south slope, and there is hardly work enough done, it is not stoped over far enough on the north slope.

Mr. Dickson:

(Q.) Where is that?
A. That is the A raise, or the A stope, rather.

The Court:

(Q.) That is back here (indicating)?
A. Yes, that is referring to all of that A stope.

Mr. Lindley:

(Q.) Would you call those branches or streaks of the same vein?
A. I would call them branches.

847 Q. But with reference to their southerly and northerly trend, and passing over the anticline, are they both alike in that regard?

A. Yes sir. The upper one is not stoped over quite as much as the lower one, but it is stoped over the top of the anticline so that it has a northerly dip there.

Q. Well now, where next do you see the vein where that same or a similar condition is exposed, if any?

A. Between there and the extreme western workings on the top of the anticline, I am not familiar with, but I have been up in the stope which is the stope where the 200 A raise is put up from.

Q. That is up at the West end of the MacNamara west end workings?

A. Yes, that is in the MacNamara ground.

Q. Yes sir.

A. And that stope can be followed up and continues over the top of the anticline on the northerly dip of the vein there.

The Court:

(Q.) May I interrupt for a moment? What did you say about 494 raise?

A. That raise has been put through, been connected through here. There is a connection made there, and there is ore continuous. It is continuous now.

Mr. Lindley:

(Q.) I would like to have the privilege of having our engineer put that connection on the model.

The Court:

(Q.) The number, though, instead of bein- 494, Mr. Jackson, is 481, isn't it?

A. Well, it may be, the lower branch. This upper one, I believe, is 494. I have't the number of the lower one

848 there.

Mr. Lindley: That has been connected later, and we will have that put on the model.

Q. Now, Mr. Jackson, you may proceed; your next place?
A. Well, there is as far westerly as I have been, in the neighborhood of the 200 A raise.
Q. That is as far westerly as you have been. I believe you testified that so far as this most western exposure is concerned, that you have seen, then, that the stope went over the anticline? What about the vein?
A. There is one large pillar right left in the vein shortly east of the A raise, which is still in place there and shows the quartz or vein going over there and in contact with——

Mr. Dickson:

(Q.) Going over where, Mr. Jackson?
A. Over the crest of the anticline. The quartz is in place and against the hanging wall there are several smaller pillars there on the north slope; the hanging wall is a smooth, unbroken wall in that neighborhood and has a gradual curve.
Q. A what?
A. A gradual curve up from the south and over on the northerly dip of the vein.

Mr. Lindley:

(Q.) Now, have you been in the raises that have been identified in the case; we call them the A raises?
A. Yes sir.
Q. The 2 A, 4 A, 5 A, 6 A, 7 A; you recollect those raises?
A. Yes sir.
Q. Have you been on those raises?
A. Yes sir.
849 Q. What do you find in those raises?
A. I find that in those raises mentioned, there is a heavy gouge hanging wall or fault going up, which has been followed up in those raises and along the gouge or hanging wall almost continuously there is ground quartz, crushed, quartz, or drag quartz, and in some places there are large pieces of square quartz or quartz that is not ground. It is in larger bodies. I do not know how it came there, but it is different from the ground pebbles that I speak of.

Mr. Dickson:

(Q.) It is what?
A. It is different from—there is two classes or kinds of quartz there, Judge.

Mr. Lindley:

(Q.) You are speaking of going up those raises and referring to the hanging wall; what do you mean, the hanging wall of the raise?
A. The hanging wall of the raise is gouge or fault.
Q. Well, what are those raises run up on?
A. Let me see now if I get just what you mean?

Q. I mean are those raises run up on a vein, or are they up on a fault?

A. I think they are run up on a fault.

Q. Where does that fault lie with reference to the vein?

A. It leaves the main vein at an angle at the crest of the cline in that section, and is out of the top of the A stope.

Q. Do you know whether those raises are run up on the of the fault or diagonally?

A. I do not know.

Q. You do not know?

850 A. No.

Q. How about the raise called A raise, or you call it 200 A raise? It is called the A raise by the Defendant in case, running out of the MacNamara stope?

A. That was also put up on a fault gouge in the hanging and has some drag quartz in it, and some quartz stringers in raise. Not lying with or conforming to the hanging wall.

Q. The hanging wall of what?

A. Of the raise.

Mr. Lindley: Take the witness.

Cross-examination.

Mr. Dickson:

(Q.) What is your present business, Mr. Jackson?

A. I am shift boss for the Jim Butler Mining Company.

Q. Well, are you in the mercantile business, or did I misun stand you?

A. No sir, I am shift boss underground for the Jim Butler ing Company.

Q. How long have you been such?

A. Since the 5th of last April.

Q. When did you work in the west end claim?

A. I did not work directly in the west end claim. It over in the Ohio, but for the West End Company.

Q. You did not work in any of the West End workings are shown upon this model?

A. No sir.

Q. And when did you work over in the Ohio for the West Company?

A. It would be, I think, a part of May and June of 1

851 Q. When did you make the examination to which have testified?

A. This month.

Q. When, how long were you engaged in it?

A. I went down I think seven trips.

Q. When first.

A. On the third of this month.

Mr. Dickson: As I understand, no doubt his Honor will at those raises, and I won't spend the time in cross examina He can see it better than any witness can describe it.

Mr. Lindley: Certainly.
Mr. Dickson: That is all.
Mr. Lindley: That is all.

Testimony of JAMES W. CUSICK, being called and sworn as a witness on behalf of the Plaintiff, testified as follows, to wit:

Direct examination.

Mr. Lindley:

Q. Mr. Cusick what is your occupation?
A. Mining.
Q. How long have you been engaged in mining?
A. For about twenty six years.
Q. In what capacity?
A. Why, in all capacities.
Q. Working underground?
A. Yes.
Q. In what sections of the world?
A. I have worked in Michigan, Wisconsin, Idaho, British Columbia, Washington, Oregon, Nevada, and Arizona.
852 Q. How long have you been engaged in working in the mines of the Tonopah District?
A. About ten years.
Q. What mines have you worked in?
A. I have worked in the Montana, the Tonopah Mining Company and the Belmont.
Q. For whom are you now working?
A. Tonopah Mining Company.
Q. As a miner?
A. No, sir.
Q. In what capacity?
A. Shift Boss.
Q. Then you are present Shift Boss of the Tonopah Mining Company?
A. For one of the shafts—for the Mizpah shaft.
Q. To what extent are you familiar with the under workings of the West End and MacNamara mines, along what is claimed by the Plaintiffs in this case to be the top of the anticline or fold of the West End-MacNamara vein?
A. I am acquainted in the workings where the series of A-Raises are put up, and also three raises on the eastern end of the West End claim.
Q. Have you examined the vein as it is exposed in those raises?
A. Yes, sir.
Q. Having reference to the latter raises, what raises did you say they were?
A. 569, 571 and 573.
Q. What conditions do you find there with reference to this so-called rolling vein?
A. Well, you can follow the same plane of quartz up through the

stopes, quartz that they have stoped; the streak they used as their hanging wall, or part of their hanging wall, you can follow it up and over the anticline into the three raises.

853 Q. Any break?

A. Yes, there is a break.

Q. What kind of a break?

A. It is similar quartz about the *the* same, breaks and goes up and turns back again.

Q. You mean breaks in direction—changes its direction?

A. No; it changes its direction—here is the lower one, and the upper one breaks away and goes up and turns back down again.

Q. You mean that overlying seam?

A. Yes.

Q. And the underlying seam?

A. Yes.

Q. The slope of them is about the same?

A. Practically.

Q. And do they connect with each other?

A. Yes, sir.

Q. On the north and south ledge.

A. Yes.

Q. Do you know by whom those stopes were made?

A. Do you mean the raises?

Q. Yes, the raises, rather.

A. I believe I understand that part of them was drove by the West End Company and part of them by the Butler company.

Q. Part of them by the Butler company. Now, have you examined the condition of what we call the 200-A raise?

A. Yes.

Q. What did you find there?

A. Why I found little places that they had stoped over the anticline, taking all the ore out. There is a few little pillars left, some of them—some large ones.

Q. Well, they show a vein there in these pillars?

A. Yes.

Q. Well, what happened—what is the condition there with reference to a roll over, if there is one?

A. There is a roll over there—that is they have stoped out on the roll over; the hanging wall there is as perfect a hanging wall as there is in the camp.

854 Q. But with reference to the pillars remaining there they indicate what?

A. They are quartz—quartz there in place.

Q. Do they indicate the vein?

A. Yes.

Q. In position?

A. Yes.

Q. Now, with reference to these raises referred to, the A-Raises, 5-A, 6-A and 7-A and 2-*a*, you recall those raises?

A. Yes.

Q. Did you go up those raises?

A. Yes.
Q. What are those raises on?
A. I should say that they are following a fault of fine drag quartz, and what we term hanging wall quartz.
Q. Where do those raises lie, or where does that fault lie with reference to the position of this vein, which you have been describing?
A. Why, I believe outside of a little gouge underneath it, it forms a hanging wall for the north slope of the vein.
Q. To what extent?
A. I could not exactly say. I don't know exactly what you mean.
Q. Well, you have described an anticlinal vein?
A. Yes.
Q. And a raise going up into a fault?
A. Yes, sir.
Q. Does that fault lie over the vein or does it cut the vein?
A. Why, it lies over the vein.
Q. It lies over the vein. You used the term "break"; I understood you to say that there was a break in the vein forming the upper and lower streak, and that the upper streak went over the anticline and joined on the opposite ledge?
A. Why, it does not exactly break, it is separated.
Q. Separated?
A. Yes.
Q. And goes in which direction—north and south, tur-ing over like the lower seam?
A. Yes.

855 Mr. Lindley: Take the witness.
Mr. Dickson: Those are pretty leading questions.
Mr. Lindley: Well, my understanding was that that was what he did say.

Cross-examination.

Mr. Dickson:

Q. When did you make the examination in these raises, and what you call the top or crust of the anticlinal fold?
A. I believe that the first time I went through there was about the third of the month.
Q. The third of this month?
A. Yes, sir.

Mr. Dickson: That is all.

The Court:

Q. Mr. Cusick, what do you mean by hanging wall quartz?
A. It is quartz that we find through the hanging wall in the shole district.
Q. And how is it different from other quartz?
A. Why, I could not say, that there is any difference—it doesn't

carry any values as a rule, and it is just stringers of quartz that are thrown through the hanging wall,

Q. Those stringers are in place are they?

A. No, sir, they are not in place.

Mr. Dickson:

Q. How is that?

A. They are not in place.

Q. Is not in place?

A. No. I don't know what you mean by the word "place."

856 The Court:

Q. Well, are they broken up, or are they in the rock where probably they were put originally?

A. Oh, broken up quartz.

The Court: I think that is all.

Mr. Dickson:

Q. Do you mean to be understood as saying, that in your opinion, either in the 2-A Raise, 4-A, 5-A, 6-A or 7-A raises, you found any quartz except what is broken, as distinguished from quartz in place?

A. I did not see any quartz in place there.

Q. None at all?

A. None at all.

Q. In any of the raises?

A. No, not in any of the raises. You might see a block there of about four feet of quartz, that is all.

Mr. Dickson: That is all.

Mr. Lindley: That is all.

Testimony of FRED SEARLS, JR., — being called and sworn as a witness on behalf of the Plaintiff testified as follows, to-wit:

Direct examination.

The Court:

Q. What is your name?

A. Fred Searls Jr.

Mr. Lindley:

Q. Mr. Searls, what is your occupation?

A. I am a geologist.

857 Q. Where did you acquire your preliminary education in the work?

A. Graduated from the University of California, department of Mining and Geology in 1909.

Q. To what extent have you followed your profession, either during your college course or since?

A. Well, previous to entering college, and for some years I have been familiar with mines, having worked as a miner in the California

mines, both along the Mother Lode, and in the Grass Valley and Nevada City Districts. For a year subsequent to graduation I occupied a position as Instructor in Mineralogy and petrography, University of California, during which year I also did some Post Graduate work in geological subjects. Subsequent to that time I have been continuously engaged in the examination and study of ore deposits throughout the western part of the United States, Canada and Mexico. I have for the past three years and a half been geologist for the Goldfield Consolidated Mining Company, and still occupy a position as consulting Geologist to that company, advising as to development work in their various properties in Goldfield and Aurora; while occupied in that capacity I have also been engaged by various other companies, particularly the Gunn-Thompson people in examination of properties throughout the country and in Mexico; I represent the Canadian Exploration company in the State of Nevada, and am familiar with their properties in Ontario, Canada. For the past three years, I have endeavored so far as I have had choice in the matter to devote my attention to the study of ore deposits in the tertiary volcanic rocks, this study having comprised a large number of the camps in Nevada, and also some similar deposits in Mexico.

858 I will say that I am familiar with a majority of the larger mining camps of the State of Nevada, and a great many of the small ones.

Q. Are you familiar with the properties known as the West End, Jim Butler, MacNamara properties, in the Tonopah District?

A. I am, yes sir.

Q. To what extent have you examined the mines in the Tonopah District, generally?

A. I have only a slight acquaintance with any of the mines, other than the properties you mentioned. With those I am very familiar.

Q. How long have you been engaged in the study and examination of the mines in controversy in this case?

A. At intervals since early last April, the whole amount of the time so spent being in the neighborhood of six weeks.

Q. The age of the rocks in which these veins occur are of the tertiary?

A. Yes sir.

Q. Will you explain to the Court the examination that you have made of these properties, the underground workings the position in which the vein or veins lie, the enclosing rocks, the occurrences that have produced the results shown in the ground, and make an explanation to the Court from your observation *at* to what you find as exhibited in the underground workings?

A. I will, yes sir.

Q. You may preface your statement with your general discussion of the vein systems, as leading up to you- ultimate deductions in the case in point?

859 A. I should like, if I might, to be permitted to discuss briefly one form of contact vein with which I have become

familiar in studying the mines in the tertiary lavas in southern Nevada and northern Arizona.

I might say, parenthetically, that I am not aware of the fact, if it be a fact, that contact—the term contact vein is limited either amongst miners or geologists to contact metamorphic deposits in which the vein minerals themselves are referable to one of the two rocks which form the contact.

I say that because amongst the California miners with whom I grew up, it is customary to signify by the term contact vein a fissure vein along which the motion that took place brought two different rocks into contact, so that the miners think of such veins favorably as being apt to have considerable continuity; experience probably having taught them that a fissure along which enough motion has taken place to bring two different rocks into contact is apt to be a fissure of considerable extent and continuity.

But that is not the type of contact veins to which I wish to refer briefly.

In the movements that have affected the southern Nevada regions, where they are covered with a pile or accumulation of sheets of different lavas, it seems to be a widespread occurrence that these movements have affected the lavas in a way that has made them move along each other so that it is a common thing in finding a contact of two different lavas in the southern Nevada country to
860 find some motion, or evidences of motion having taken place along them; and a good many fissures formed by such motion have been mineralized and become veins, so that I know of quite a number of veins in southern Nevada that have been found along contacts between two different lavas, without any large motion having taken place there, the rocks having been in juxtaposition before the motion took place.

The vein of this type with which I am perhaps most familiar is the main vein of the Goldfield Consolidated Mines Company, located about 26 miles from here, and I would like to explain briefly one or two points about that vein.

Mr. Dickson: Well, make that as brief as possible, Mr. Searls.

Mr. Lindley: Well, it is comparative. It is comparison, that is the only way they can reach deductions, by comparison.

Mr. Dickson: I think it will be sufficient to describe what is observable in that regard in this mine, as in some other mine.

Mr. Lindley: Well, do you object to it, Judge?

Mr. Dickson: If it is going to take any time, I object to it, yes.

The Witness: I can probably finish the discussion in two or three minutes; five minutes at the outside.

Mr. Dickson: All right.

The Witness: On the 600 level of the Goldfield Consolidated Mines Company, the main vein in plan occupies the contact between two rocks which are very similar to the rocks in which the veins
861 in the MacNamara West End and Jim Butler properties occur. They are called latite and dacite. The distance which the vein follows that contact on that level is about three quarters of a mile.

The Court:

(Q.) Just a moment. That dacite is quite different from *our*, is it not?

A. It is very different from the rock which is here termed the Fraction dacite breccia, being not a fragmental rock, and of some different chemical characteristics.

The Consolidated vein crops in the dacite and comes down through the dacite and at about the 600 level becomes tangent to the latite dacite contact.

It then picks up that contact, following it as a plane of weakness for a distance of about 400 feet on the dip, and the contact then having turned in a direction quite different from the dip of the vein, it enters the latite and continues in the latite to a depth of about 1,100 feet.

At that point it has run clear through the pile of volcanic rocks which are there piled upon an old pre-tertiary surface of shale and granite. And the late interesting developments in the Consolidated perhaps have——

Mr. Dickson:

(Q.) What is that?

A. The late interesting developments in the Goldfield properties have occurred at the point where the vein coming down through the latite becomes tangent to this old shale surface, and where it comes down and becomes tangent to the surface, it follows the surface to the greatest depth to which it has yet been followed. And the drifts in the lower levels, the lower 3 or 4 levels of the mine have followed contours on the old surface and picked up ore bodies existing in depressions and along that old surface.

I wish to show here the appearance of a section drawn in a direction from the Laguna shaft down toward the 604 ore body. This being roughly a sketch plan of the 600 level, a section along the line A B would show a form like that indicated between the red lines from the point X to the point Y.

The vein has followed the dacite latite contact where it has had an irregularity in strike, as shown in the plan above, which causes in the section an anticlinal roll in the vein. The vein at this point has been very rich indeed, so that——

Q. Has been what?

A. Has been very rich indeed, so that stopeing has followed continuously over that anticline on ore of the grade of a hundred dollars a ton, at least.

Mr. Dickson: I can not see the relevancy of this testimony to the question here under consideration.

Mr. Lindley: I have never in the course of my career stopped a scientific witness. We do not know the operation of his mind. He has to lead up to it. It is some of his experience that we are getting, and it seems to me that if it is not relevant, if it is not shown to be relevant, the Counsel later on when he comes to connect his testimony up may ask the Court to strike the testimony out. I think Counsel ought to let the witness go on in his own way.

Mr. Dickson: We cannot cross examine the witness upon the conditions in the Goldfield Mine; we know nothing about it. I
863 think that some latitude is given expert witnesses and expert miners in cases of this kind; they are not confined strictly to the boundary lines of the claim in controversy, or the claims in controversy, and what is developed in those boundary lines, but this is beyond any—this is latitude beyond anything I have ever heard of before, going miles away into another district altogether and describing conditions with which he no doubt is familiar, but upon which we have no opportunity or any ability to cross examine him at all.

Mr. Lindley: I recollect once hearing Clarence King on the stand in a case in Canada where he commenced with Patagonia and reached the North Pole before he got through.

Mr. Dickson: Well, you want to go to the South Pole now?

The Witness: I can terminate my remarks in about one minute, Judge.

Mr. Dickson: Well, go ahead.

The Witness: The vein being pursued upon its dip down through the latite to the shale contact that I spoke of shows there the same tendency to follow the pre-existing contact over irregularities. So that in the Jumbo Ex*n*tesion Mine, which adjoins the Consolidated, the same vein has been followed in a similar way over an anticlinal roll caused by a hogsback between two ravines in the old pre-tertiary surface.

I wish to mention these matters simply as being examples of the way in which contact veins of this type formed along fissures that have followed a pre-existent contact will frequently, in this
864 part of the country at least, take the irregularities of that contact and conform to them, so that anticlinal rolls, synclinal rolls or irregularities of that kind are not exceptional, or to one familiar with veins of that type anything to be wondered at or unexpected.

I see considerable similarity in the West End MacNamara vein to the vein which I have just mentioned, as regards the mechanics of its formation.

It has followed the contact between the Mizpah trachyte and whatever rocks underlie it, wherever that contact was not at too wide a variance with the position and direction of the major portion of the vein. In other words, it has followed that contact except at such points where a sudden and marked irregularity of the contact has caused it to break off of the contact and enter the Mizpah trachyte, just as the Consolidated vein follows the old pre-tertiary surface until the shale dips at a marked angle away from the vein, whereupon it enters the latite and exhibits a second and similar tendency at the latite dacite contact, 600 feet above.

Mr. Lindley:

(Q.) Now, Mr. Searls, you may take up this vein and proceed. Label that illustration as Searls I.

A. (Witness marks illustration.) The first time I ever entered

he properties under controversy, I went into the stope which is
narked 18 on the model, "Plaintiff's exhibit No. 2"; these stopes
eing unde- the territory owned by the Jim Butler Company and
onstituting a portion of the ore in dispute.

Following up those stopes in a northerly and upward direction, I
came to the top part of the stoped portion of that vein, and
65 there entered a raise marked 569 on that model, which raise
was then being driven by the West End Company. The next
me I saw that raise it had joined the No. 4 level at a point under
ne 488 raise.

Having been engaged in directing a portion of the work done by
ne Jim Butler Company to expose the conditions in the ground, it
ecame desirable later to drive that portion of the 569 raise which
onnects with the 537 raise. At that point the 569 raise was nearly
ull of dirt, dirt having been dumped down, I think, from the 400
vel in the prosecution of some other work, and in order to start that
aise, the continuation of that raise over to the 537 raise, which
ortion is a flat drift or winze, it became necessary to clean out that
69 raise, and I took a photograph of the point at which we started
ne flat portion of the raise to go over and connect with the 537 raise,
r to follow the vein which was at that point exposed, going into the
foot wall of the 569 raise as it then existed. I have that pho-
66 tograph here. Shall I mark this Judge.

Q. Yes, mark it Searls-2, are there two of them?

A. Yes, two of them.

Q. Mark it Searls-2 and Searls-3.

A. (Witness marking exhibits.)

Q. *So* them to counsel.

A. (Handing photographs to counsel.) The photograph marked
earls-3 was taken with the camera in a position which I now hold
y finger, being a point at which the 569 Raise left stope-16. This
the way that raise looked when we cleaned it out prepar-tory to be-
n-ing the work; the extreme left han*f* portion of the photograph
ows the top edge of the No.-16 stope, at the exact point where the
69 raise leaves it. There is seen along the vein in the back of that
ope a dark streak, which is a characteristic ore streak of the stope
om its lower portion on the 600 level of the West End mine; that
reak has quartz both above and below it and it probably represents
e silicification of the original vein fissure, the dark color being
ue to sulphides present. That streak may be seen in the photo-
aph following along the easterly side of the raise and across the
wer north face of the raise; the photograph also shows that a round
holes has been partially drilled in the raise, and one hole may be
en, which is completed near the right hand side of the raise, and
e drill is still sticking in the next hole to the left. Before we did
ny work there the raise had been driven to that point, and then a
rtical jump of about eight feet had been made, and the raise con-
nued on up in a northerly direction at a steeper dip. The Photo-
aph gives a slightly—it represents an inclined view so that to see
the way it looked in the ground, it has to be held up. The
67 tape line at the left of the raise, is hung vertical as a plumb

bob so that it shows the inclination of the raise at that point. It is practically horizontal.

The Photograph "Searls No.-2" is a slightly nearer view of the same face, and shows the black streak mentioned a little clearer, being a closer view; a small pick and the handle of a shovel shown here, on the black streak. I should like to say a word about this black streak. It is found usually near the foot wall through the stope eighteen and where seen is usually in the edge of a pillar, because it represents a portion of the vein which has been removed as ore; it is what is commonly termed in Goldfield, and I think in this camp, as an ore streak.

Mr. Dickson:

Q. An ore streak?

A. An ore streak, yes, sir. That black streak may be followed now continuously along the 569 raise where it is in its flatter course, and connects with the 537 raise, some of that being a winze, except that at one point this streak and the quartz that accompanies it, dip under the bottom of the raise for a very short distance; this streak may also be seen in stope-17 of the Tonopah Mining Company.

Mr. Dickson:

Q. What is that?

A. In Stope 17 of the Tonopah Mining Company. In order to explain or to exhibit a little more clearly some of the other characteristics of the vein from which this stope 18 has been excavated, I have prepared a section on a scale of twenty feet to the inch, a north and south section, through 573 raise, and continuing through the whole mine.

The plane of this section or the direction of its trace on the horizontal plane is indicated on the large map, Plaintiff's Ex-
868 hibit-1 by the red iine marked at its extremities "G-G."

Mr. Dickson:

Q. Have you a copy of this Mr. Searls that you can furnish us?

A. I will furnish it. I haven't it right now.

Mr. Lindley: Mark that Searls-4.

Q. I understood you to identify that as being a section along the line "G-G" shown on Plaintiff's Exhibit No. 1?

A. It is. The representation of the workings as shown upon this section has been placed thereon as a result of special surveys to indicate more exactly the contour of the stopes and raises, than is ordinarily taken in the survey of a mine; that is, the detail and the exact shape,—the outlines of the stopes and raises are shown correctly; having this detailed survey, I undertook then to place upon each one of the workings exposed the exact representation of the quartz which was exposed in those workings, and that is indicated on this section "G" by a brighter shade of red paint. This was accomplished by taking the section, surveyed underground and sketching each stringer or veinlet of quartz, on the surveyed *the* section just

as it occurred in the mine, so that to the extent that this section cuts the workings, intersects workings in the mine, it shows correctly the quartz which is to be seen upon the sides and edges of those workings. There are some difficulties in the way of making an exact representation upon a section of that kind. One of them is that where you have the section cutting a large stope, such as that shown immediately north of the West End-Eureka line, the ground has actually been taken out, stoped and sent for ore, so that you cannot see the exact plane of that section through the stopes, the veins or the plane of rocks which the section would intersect, and for
869 that reason, I have omitted the detail of the cross stringer, because I don't know just what it was, and have indicated around the edges of the stope where I can see them, the representation of the quartz. Also there is difficulty in that it would be impossible to represent upon any scale smaller than a scale of one foot to one foot, the entire amount of quartz in detail, as it occurs in this vein, for the reason that in such places as this stope, to which I have referred immediately north of the Eureka-West End line, a large proportion of the rock actually removed has been trachyte, but it has been silicified trachyte, and the silicification of the trachyte has been largely accomplished, by the medium of a large number of very fine stringers of quartz, which of course it is impossible to represent on a scale of twenty feet to the inch, and I have, therefore, put on the section a lighter red color, which represents in a more general way that portion of the rock which is impregnated with silica as fine veinlets, and also those portions of the vein which I have not been able in this section to observe exactly, because the section does not cut openings there. For instance in the block of ground between the stope referred to and that at the side of the raise from the 500-level, there is no reasonable doubt that that whole block of ground is filled by stringers of quartz varying from a fraction of an inch to two or three feet in dimension, but I have not represented them on the section because I cannot see the detail of them, and what their dimensions and position are. The position of the cross section is as was stated, shown on the map by the line "G-G"; as will be observed on that map the section does not cut exactly all of the workings that are shown upon section "Searls-4," but there has been very
870 little projection, that is projections for only short distances,——

Mr. Dickson:

Q. What do you mean by short distances? What is the maximum projection?

A. About twenty five feet. The Maximum projection occurs in projecting a portion of the 712 cross-cut onto the section, where it is distant some twenty five feet in the vicinity of station 712-3.

Now where a working is not cut by the section it is impossible to project upon the section each individual stringer in its own direction up to the section, because stringers are so ramifying that such an attempt would be further from the truth than to project bodily the face of the working, which is actually sketched in a note book onto

the section and show it as it is seen in the ground, although not the exact position in the ground which this section intersects; so portion of the 712 cross cut has been projected on the section in th way. It does not represent the exact detail as regards stringers quartz that would be seen if one could see the face of the grou which the section cuts, but it does represent the exact detail as se upon a portion of the 712 cross cut, which is projected bodily in the plane of the section. This has been done in a few short i stances.

Now the black streak which I referred to a few moments ago, m be seen at the 600 level, where the stope, as shown upon this secti departs from it, and there enters the floor of the level. It is n seen again below that, except in the stope which has been excavat by the West End company, under the floor of that winze mark "winze" on exhibit Searls-4.

Mr. Dickson: Show that on the model.

A. It is not shown I think on either model.

871 Q. Does it lie between the Fraction vein and the south di ping vein, as we call it?

A. No, sir, it lies under both, or, rather, is the lower portion what you term the south dipping vein. That streak is beginni to show in the very bottom of the winze, so it is my opinion that t winze was put down on what might be termed an upper strand the vein.

Mr. Alling: 700 winze?

A. The 600 winze of the West End company, and certainly in portion of the winze where the stope is shown the better portion of t vein lies under the winze, and the winze itself is driven down silicified trachyte, with stringers and veinlets, and fragments quartz all through it, and this condition persists up into the hangi wall of the vein, into the 712 cross cut, a distance of thirty f vertically, and there is no reasonable doubt that the block of grou vertically below the 712 cross cut down to the winze is simply fil with ramifying stringers, although the section is not opened up observation so that one could place on here the exact way in whi all these stringers occur. The black streak that I referred to can traced up the stope rather continuously along the foot wall of t stope. It is seen for instance in the 500 level where the section c it; it is also seen in the foot wall of the stope under the Eureka-W End line, and I referred a minute ago to the five hundred level- meant an intermediate between the five hundred and six hundr level; also seen in the 500 level between the stope referred to and t drift, from which the raise was put up to the vein, and may be se rather continuously, except where the stope is filled, up the 573 ra

and may be seen at the little intermediate drifts, shaded

872 above the word 573. It is accompanied, as here shown a rather massive vein of quartz, and this massive vein quartz can be traced continuously along the flat part of the 5 raise to where it turns over a winze, and down to the point where is shown, to rather become smaller and a portion of it to disapp under the foot wall of the workings just below the mark "M. 7

under the 461 raise. There is right under the 400 level, just west of the point where the word "461" occurs a smaller segment of the same vein or ore streak dropped down by two little faults, so that the detail of this kind, shows a break in the vein there which is, however, not the full width of the quartz there displayed.

873 As shown by the red coloring above the stopes, and between the stoped portions, it is my belief, and I think a matter about which there can be very little question, that as many stringers exist through that shaded portion, as shown to exist by the 712 cross cut.

The quantity or amount of stringers in the hanging wall of the main stoped portion of the vein is a variable quantity, however, There are cross cuts in the mine, as for instance, the 722 cross cut in the Jim Butler, which is nearly barren trachyte, very few quartz stringers in it. And there appears to be perhaps some local differences of that kind which may be the result of a cracked or disturbed condition of the hanging wall over some inequalities or irregularities of the vein.

The 461 raise is not intersected by this section, but is projected a few feet on to the plane of the section. And the quartz there displayed is as exact a representation of the quartz as it occurred in that raise in reference to the gouge and to the walls of the raise as can be displayed on this scale.

As exhibited by the section, there seems to be no reasonable doubt, in fact, I am very sure that the vein which is shown in the winze below the 600 level, and in the stopes between the 6 and 500 levels of the West End working, continue up the 573 raise and is followed by the flat portion of that raise where it turns into a winz*w* downward to the north as one contin-ous vein.

In the hanging wall of the 461 raise is shown a heavy gouge which has been referred to heretofore as the Siebert fault. This gouge in that raise does not occupy the position of a hanging

874 wall to the quartz that occurs in the raise. The quartz occurs as ramifying stringers, two of the most important of which have a sort of anticlinal roll across from one side of the raise upward and down again before they enter the foot wall of the raise, conforming somewhat to the anticlinal roll of the vein beneath. And those which occur in the raise above that—of those which occur, the most prominent one is cut off and dragged by the fault gouge which shows in the top of the raise.

This section is very interesting as indicating the probable displacement of the Midway andesite by the Siebert fault. The section runs very close to the 400 level of the Jim Butler and the 420 raise, and upon that 400 cross cut near the side line, the bottom of the Midway andesite is seen to have the configuration which is represented on this section; dipping downward toward the north into the top of the cross cut, and then rising and cutting the side line raise, also called the 420 raise above the drift and going up toward the north.

The Midway andesite is next shown in the vicinity of this section in the McQuillan shaft, and in the 488 raise, as being only slightly above the Siebert fault in this latitude, so that there is no doubt but that the andesite which was rising to the north has been fauited down

by the Siebert fault a distance of in the neighborhood of 150 feet in this section.

There are shown in the foot wall of the section two rocks. The
West End rhyolite and the glassy trachyte, which are in-
875 dicated by the symbols W. E. R. and G. T. respectively.

Throughout the whole length of this section the main West End-MacNamara vein is shown to be a contact vein between the Mizpah trachyte and the rocks which underlie it.

The rather irregular appearance of the glassy trachyte and the West End rhyolite is referrable to the fact that the section cuts these rocks very near an irregular contact which in a general way has a northerly and southerly trend, so that the section is nearly parallel to that irregular contact.

In the Tonopah Mining level—Tonopah Mining No. 6 level, about one hundred and fifty feet easterly of this section, the rock in the footwall of this vein throughout the entire crosscut is glassy trachyte, and I selected three samples from that rock. What shall I mark these, Judge?

Mr. Lindley:

(Q.) Searls, following the sequence: Searls 5, 6 and so on?

Mr. Dickson: As I understand, there is no dispute in the evidence on either side that in this section the footwall rock is glassy trachyte, and the hanging rock is Mizpah trachyte.

Mr. Lindley: You called it all trachyte, I think.

Mr. Lindley: No, we distinguished between glassy trachyte and the overlying trachyte with the first witness we put on the stand, Mr. Wiley, on that section. I do not care a great deal about it.

The Witness: I marked these "S. 5," "S-6," and "S-7," respect-
ively. These are samples of glassy trachyte and show what
876 the glassy trachyte nearly always shows, a flow structure. Before I took these samples from the ground I marked with a hand level a horizontal position along the fragment of rock, and on one end of the line marked an arrow to represent a northerly direction. This sample was taken from this crosscut about fifty feet northerly of the footwall of the vein, where intersected in that crosscut. As may be seen in the sample——

Mr. Dickson:

(Q.) What crosscut do you refer to?

A. The six hundred crosscut of the Tonopah mining. As may be seen in that sample the flow structure has a southerly dip. It intersects the hand level line on there at an angle of about twenty degrees. The sample marked——

Q. Mr. Searls, will you just step here and point out on this "Plaintiff's Exhibit 1" where the sample was taken?

A. Yes, sir. Taken on the six hundred level at about that point (indicating).

Q. Designate so it will be in the record if we should want it.

A. I will designate that as "S. 5." At about the point marked "S-6."

Q. Just a short distance east of the east end line of the West End?
A. Yes, sir. At about the point marked "S-6" I took the sample which is marked "S-6" and also marked "2." I did not put any line on that. Did not need to put any line on it because, as shown in the crosscut there, the flow structure was horizontal. The rock lay in the crosscut in the position which I now hold it, and the lines of the flow structure can be seen extending in a horizontal direc-
877 tion.

The sample marked "S-7," and also marked "3" was taken from a position near the point now marked in pencil on "Plaintiff's Exhibit 1" as "S-7," and the flow structure, as shown in relation to the hand level line there dipts to the north, so that the flow structure of the glassy trachyte in that section underneath the vein exhibits the same change or dip from a southerly direction to a northerly direction as one goes north in the crosscut. And the flow structure is commonly—Commonly represents the position in which the rock in which it occurs lay in the ground, in which it was spread out because the lines are representative of the direction in which the magma flowed while it was cooling.

The Court:

(Q.) That is assuming that it was undisturbed since?
A. Yes, sir. I might qualify that statement also by saying that there are exceptions to that, because flow structure is sometimes at an angle to the direction in which the greater areas of the rock exists.

Raises 571 and 573 were extended to the north following the vein which has been stoped in stope 18, in the same way as raise 573 is shown to do in Section G. The vein in each of these raises is very clearly and definitely shown as turning over from a southerly to a northerly dip, extending down to the North as far as the raises extend.

There is—the actual structure of the quartz, as followed up from the stope and the main band of quartz stoped in the stope
878 turns over and follows these raises and exists in them in a position which indicates, to my mind, very clearly that the actual ore streaks, and the vein itself turns over and is not terminated by anything.

Upon the Siebert Fault which has been referred to, a number of raises have been put up in the easterly end of the mine, I mean raises 488, 461, 2-A, 4-A, 5-A, 6-A and 7-A.

No one of these raises follows any continuous vein, Raise 488, the first time that I entered it was driven up diagonally, following for a short distance the Siebert Fault, then driven through the Fault and away from what stringers of quartz underlay it, into the cap
879 rock. Subsequently more work has been done there so that at present the raise follows the Siebert fault to its face, and below the fault stringers of quartz are seen intersected by the fault.

Raise 2-A follows the fault in a similar manner, and has a number of stringers in the trachyte underneath it. I have in my note book a detail of that raise. This detail was sketched in the ground. I

have marked this "Sketch-8" it is a sketch made underground of the 2-A Raise as it existed last May.

Mr. Lindley:

Q. Made to scale?
A. Made to a scale of——
Q. What scale?
A. Ten feet to the inch. Extending along the back of that raise, from its bottom to its top, is seen a heavy gouge which is the Siebert Fault. Indicated in red on the Raise is all the quartz that occurs in that raise up to that time. I believe that the raise has since been extended a few feet. The stringers of quartz which are there shown are not conformable to the gouge, which exists along the back of the raise, but run in various directions, and each and nearly every one of them are seen to be terminated by the gouge of the fault.

In the middle portion of the raise, a strand of the fault has broken off from the portion which is in the hanging wall, and exists as a gouge plane, about half way down the raise, and quartz may be seen below and above that, being these stringers which occur between the two gouges, being terminated on each end. At the bottom of the raise near the stope, two heavier stringers of quartz are seen, which here, as is very frequent in these raises, appear to have an anticlinal or rolling form.

The similarity of these stringers to those which exist in the
880 712 cross cut, and in the 600 winze above the vein, or comprising the upper portion of the vein, and in the 400 level and workings shown upon this section, "Searls-4" immediately under the 400 level, and in the 461 raise, is very striking.

In the 4-A and 5-A raises, there is a good deal more quartz than is in either 488 or 461, or 2-A. In each of these Raises the quartz attains a width in some spots, I think, of three to four feet. And in the 5-A Raise it is persistent up the raise for some sixty feet in a position which makes only a slight angle with the Siebert Fault. At the upper extremity this stringer or vein of quartz turns up suddenly and is cut off by the Siebert Fault, so that drag pebbles and fragments may be seen where th- gouge intersects and terminates it.

Mr. Dickson:

Q. That is 5-A.
A. That is in 5-A. At the bottom of that raise—the other end of that quartz is seen to go down from the bottom of that raise, so that it does not follow the raise to its lower extremity. In the little raise which is driven from the A-stope, vertically up to that 5-A raise, there are very numerous stringer- of quartz, one of which is four or five, perhaps as much as eight inches thick, extending vertically, that particular one, and others ramifying in other directions; so that to my mind the conditions as shown in those raises is exactly what might be shown if a heavy gouge were to be passed through the country in the 712 cross cut, and running off in any direction. A number of stringers of quartz would then be seen abutting on the

gouge, but the conditions as there represented would not be that of a raise or working following a continuous vein.

881 If the Siebert Fault did not occur in the A-series of raises, there would be nothing there different from the hanging wall country rock above the vein in a great many places throughout the West End and MacNamara Mines.

A similar condition to that shown in the 2-A, 7-A series of raises is also shown in the A-Raise in the MacNamara ground, as shown on Plaintiff's Exhibit-2. This raise has been driven up on the Siebert Fault, which is tangent to the vein at a point west of the bottom of the raise and follows up upon that fault at an angle oblique to its dip and strike. A number of stringers of quartz can be seen in that raise, and near what was its top yesterday, quartz to the width of a foot or more can be seen coming up from the floor of the raise, at an angle or dip of sixty degrees, or thereabouts, and being terminated and cut off by the Siebert Fault which forms the gouge, in the back of the raise.

This same gouge is seen in the 262 Raise, near at hand where it is shown clearly to fault the fraction dacite breccia cap rock, throwing it down to the north in the hanging wall, to the northeast and is continuous down that raise, and may be traced without a break into the 252 raise; 258 raise it is marked here.

The Court: This case is continued until two o'clock this afternoon.

882 Afternoon Session, Two o'Clock P. M.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Direct examination of FRED SEARLS resumed:

Mr. Lindley:

Q. In your testimony Mr. Searls, you were discussing what?

A. I was discussing the Siebert Fault on the 200-A raise and the adjoining Raise.

Q. Well, now, before taking up the Siebert Fault for a definite line of examination, I would like to ask you to make some comparisons with reference to the gouge in the Siebert Fault and the gouge or parting, if there is any such, that appears in connection with the hanging wall of the vein. Have you made observations in the ground to determine the character of the parting in the hanging wall section in this mine, particularly in the neighborhood of the axis of the anticline?

A. I have, yes sir.

Q. Can you make a comparison between the gouge that appears on the Siebert Fault, and the gouge that is shown to form the hanging wall of the main vein? If, so, make that comparison, and state the differences if there are any?

A. There are certain places in both the north dipping and south dipping legs of this anticlinal vein, where a considerable amount of

gouge is observable on the walls of the sope, and upon the hanging wall of the vein where developed in drifts; that is particularly
883 true of the south dipping leg of the anticline along the four hundred level in the vicinity of 440 Raise, and a section of the level immediately east of that, which — labeled 400 West End, where those letters occur. The gouge here and on the stopes below throughout is referable to a post mineral fault which has been referred to as the Siebert Fault.

Q. As the Siebert Fault?

A. As the Edwards Fault,—and which follows the hanging wall of the vein for a short distance—for some distance.

Q. But away from the absence of faults such as the Edwards Fault, which you have explained, what is the normal condition of the hanging wall of the main vein as to gouge?

A. Aside from that area and the area in the north dipping leg of the anticlinal vein, where the Siebert Fault is tangent to the vein there is comparatively little gouge in the hanging wall of the stopes or the vein. A little dry gouge may be seen in places, as is indicated in the stope under the Eureka-West End Line, on section "G-44" and also in places in the MacNamara stopes. The Siebert Fault——

Q. With reference to that hanging wall is there any ore in place that has not been stoped there, from which you can determine the character of the hanging wall,—in the shape of pillars or anything?

A. Yes, the Siebert fault leaves the hanging wall of the north dipping limb of the vein in the MacNamara ground in a line that passes near the foot of 200-A Raise, or A Raise as it is called here, and runs through the extremity of the MacNamara,—near the extremity of the MacNamara 186 level, and near point 185 on the MacNamara 200 level, and from there in a general north-
884 easterly direction, and the MacNamara stopes to the north-west of that—as evidenced by the hanging wall of the stopesm where seen, and by the edges of the pillars and edges of the stopes, where the ore and total contents of the vein can be seen—does not in any place exhibit a hanging wall gouge, which is comparable at all, to the amount or character of gouge which occurs on the Siebert Fault, and along the hanging wall of the vein where the Siebert Fault is tangent to the vein.

Q. You have spoken of this vein as being a contact vein throughout the major part of the area involved here?

A. It is.

Q. Are you able to trace that line of contact with a black pencil in Plaintiff's Exhibit No.-1, to show just exactly where this vein in Plaintiff's ground appears as a contact vein?

A. I think I can do so.

Q. Please do so. Draw a heavy black line.

A. I just want to outline it first. (Indicating.)

Q. What have you written along that traced line?

A. I have written along that line "Contact vein to north and east." That line represents approximately the line at which the vein becomes tangent to the contact, and to the north and east of this it is a contact vein; it is not an exact reproduction or representa-

tion of that line, because the contact is irregular and the line at which it becomes tangent is necessarily a crooked or irregular line, and the line traced on the map represents it approximately.

885 Q. Now, Mr. Searls, there are two important features in connection with this case that I wish you would take up—have you said all that you wish to in regard to the contact?

A. I explained that this morning.

Q. In your previous testimony, yes. Now, there are two important features in this case to which I would like to invite your attention, to be discussed under separate heads. You have testified with regard to the position of the Siebert fault, or its occurrence and the fact that certain raises were made upon this fault. I wish you would now in the sequence in which the question is put indicate first the position of this fault in the ground, and the date upon which you have determined it?

A. As has been previously testified, the fault occurs at the eastern end of the area mapped upon this mode, in the 500 Tonopah Mining cross cut at a point marked on the Plaintiff's exhibit 1 plan map, 25 feet north of T. I.

Mr. Dickson: Just where is it?

A. From there going westerly it is developed in the 488 raise, in the drift westerly toward the McQuillan shaft, in the 461 raise, in the back of the A stope, where it is tangent to the vein.

Mr. Dickson:

(Q.) In the A stope?

A. So lettered on the——

Mr. Lindley: That is the A and B stope, you know.

Mr. Dickson: Should be 2 A. Referred to in ours as 2A.

Mr. Lindley: This is the A and B stope which has been recently connected with an upraise.

886 The Witness: Now, in the 2 A, 4 A, 5 A, 6 A and 7 A raises. In the 496 raise, where it slices through an upper strand of the vein and displaces it. In the 494 raise, where it is developed at the point where the raise breaks into the A stope, and at the top of 2 small vertical raises which have been made upward from the main portion of the raise.

It may be seen in 466 raise, a short distance above the 400 level. May be seen in the extremities of the short cross cuts in the MacNamara ground, not lettered on the model, Plaintiff's exhibit 2, but near Stations 1041 B, 1041 A and T 17.

Mr. Lindley:

(Q.) Of Plaintiff's exhibit 1?

A. Plaintiff's exhibit 1. Where at the last three places it is not parellel or conformable to the vein which lies underneath it. It is seen on the 300 level, on the 200 level, in the 366 raise between the 300 and 200 level in two points; in the MacNamara 300 level, in the back of the small, irregular stopes just east of stope 13, near point 1077, and the stopes in which the figures M 78 occur.

It may be seen departing and diverging from the vein in the drift near the point 1077, the drift from that point on the 300 level following the vein toward the MacNamara shaft, and the Siebert fault diverging at an angle of some 20 degrees to the north.

Also in the 200 level of the MacNamara, where it is represented in blue, occurring along the drift at the termination of which the letters 45 C occur on the map, Plaintiff's exhibit 1.

887 It is seen tangent to the vein in a small portion of the MacNamara stope 7, where the vein rolls over to a southerly dip, and in the end of the 186—the southeasterly end of the 186 level of the MacNamara, it is followed by raise A, and is developed rather continuously in the 252 raise, from which a working has been recently been driven to approximately an intersection with raise A.

Q. That working still being carried on, there are some shots to be fired, is there not?

A. Yes, there is a round drilled in the face that has been there for a day or two and has not been shot.

Q. You expect it will be shot shortly?

A. I think so.

Q. That work is being done by whom?

A. By the West End Company.

Q. Under the direction of our engineers?

A. Yes sir. The fault may also be seen in the 195 intermediate, at the bottom or where it intersects the 252 raise and goes into the hanging wall of the raise, or into the upper and eastern edge of the raise, at a point a few feet below the 195 intermediate. From there on it is not seen in the 200 level below until you reach the shaft cross cut, the level being extended in the vein at the point where it has a northerly and southerly strike, being in and under the roll of the vein.

Q. Those are the points where you say that the cross cut is in evidence—or the fault is in evidence?

A. Yes sir.

Q. In making your deductions as to the condition of that vein, is there any negative evidence that you correlate with your

888 positive evidence for the purpose of determining the position and shape of this fault? For instance, by way of the absence of its appearance in other workings?

A. Well, the shape of the fault is shown in other places, as in the 500 Tonopah mining cross cut where it is shown at a point about 56 feet from the vein into the hanging wall or into the north country, very flat and nearly horizontal, in fact. And the fact that it diverges from the hanging wall of the vein and does not follow it is shown in the 537 and 533 A raises, which have penetrated the vein to approximately their tops and which, at the last time I was there, had not reached the Siebert fault, they are being extended with that expectation.

Q. The work being carried on at this time?

A. I hope so.

Q. Who is in charge of that work?

A. The West End C-mpany are doing it for the Jim Butler Company.

Mr. Lindley: Of course, I know that Counsel will ask them to speed up as rapidly as they can.

Mr. Dickson: Well, have you had any cause for complaint? I have not heard of any complaint.

Mr. Lindley: Well, I do not want to make any complaint.

Mr. Dickson: This is the first intimation I have had that there was any complaint.

Mr. Lindley:

(Q.) Now, you may proceed, Mr. Searls.

A. I do not know that I fully comprehend what you mean by negative evidence. I think -here is a good deal of negative evidence on the question of whether or not this fault forms or comprises the hanging wall of any vein, because of its not con-
889 forming with the usual attributes or characteristics of hanging walls which ought to be parellel and conformable with the vein material that underlies them, and to follow the vein throughout its course and form the roof or top of the vein.

Q. Well, the data that you have enables you to state the form and s-ape of that fault and its position with relation to, and its effect upon this vein, if any?

A. Yes sir.

Q. Then, just please explain now the relationship, the shape of this fault, and the relationship it bears to this vein, if any, and the extent to which it intersects or scores or cuts or faults the vein, if it does so?

890 A. The shape of the Siebert Fault as exhibited on the model, Plaintiff's Exhibit-2, can be seen fairly well; it occurs in the places testified to and is so represented on this model in blue paint, and may be seen to have a flat or trough shaped form with a northeasterly dip, and a form concave upward, departing to the north from the vein, as one goes to the northwest along the vein, and departing also from the vein on its dip, shown in the points mention- 537, 538-A and the Tonopah Mining Cross cut.

Q. You have stated in your testimony that at certain points the Siebert Fault is tangent to the vein. What do you mean by that, please explain it?

A. By being tangent to the vein, I mean that for a portion of the area of the vein, and for a portion of the area of the Fault, or plane of the hanging wall of the more solid portion of the vein, coincides with the plane of the foot wall of the Fault the Fault having followed that hanging wall perhaps as a plane of weakness in some such way as the original fissure followed the contact.

Mr. Dickson:

Q. How is that?

A. The Fault having followed for a portion of its area the plane of the hanging wall, as a plane of weakness, in the same way that the original fissure of the vein followed the contact for a portion of

its area. There are a few places where the fault has scored off or cut away a portion of the solid part of the vein; one of these is rather clearly shown in 496 Raise. We apprehended at one time that it would also be shown in 494 Raise, and put up the two vertical parts there to find out if such were the case or not.

In the vicinity of stope-14 of the MacNamara, the vein is
891 rather thin and the appearance is that the Fault has perhaps sliced away a portion of the upper part of the vein. Aside from this break in the solid portion of the vein the action of the fault upon the vein has been limited to the scoring away and moving and faulting to other parts of the country the stringers or hanging wall veinlets, which proceed out from the solid part of the vein in the hanging wall rock. For instance in the MacNamara, below or to the northwest of the line of intersection or tangency of the fault of the vein, such stringers are in evidence in most of the workings in the hanging wall of the vein, and to the northeast or the southeast of that line of tangency where the fault and vein are tangent, there are no hanging wall stringers in the vein to speak of.

Q. Does the Siebert Fault at any place cut or intersect and fault the main vein?

A. No point that I have ever observed.

Q. Well, if there had been would you have observed it?

A. I would have if it occurred in this ground.

Q. Have you any further suggestions in connection with the Siebert Fault and its relationship to this vein?

A. Why, I think that it is of post mineral character, as evidenced by the fact that it sheers, and cuts off the hanging wall stringers or ramifying veinlets from the main vein, and that is in accordance with the other observed facts, testified to this morning, that it cuts the cap rocks which are later than the vein. That is, one of the rather evident things I think, that if the rock is later than the vein, and the fault cuts the rock, that the fault must be later than the vein, and its displacement of the Midway audesite as shown in section "S4" and its displacement of the Fraction dacite breccia as shown in raise 252, are in accord with the
892 other observed facts, which demonstrates its post mineral character. One other criterion, which seems to me is a criterion ordinarily used by geologists in determining relations of one fault or vein to another, can be used here; also in that there are a large number of transverse faults which cut the vein and displace it a few feet and which themselves are terminated and cut off by the Siebert Fault, so that we have in this phenomenon further evidence of the post mineral character of the Siebert Fault. It is later than the faults which cut the vein; that may be rather clearly seen in a number of places in the mines, and particularly in the workings of the MacNamara on the north dipping limb, immediately northwest of the line between the West End and MacNamara on the 400 level.

The Court:

Q. Does the fault show on the surface at all?

A. I think not. It is obscured by the wash and debris; it crops for a portion of its distance through town, that is through the residential part of town, the age of the fault is such of course that any scarp that it might leave on the surface by reason of displacement, would be eradicated, subsequent to the time that it was formed.

The Court:

Q. There are faults in this district that show considerable scarp?

A. Those scarps are usually not referable to the actual displacement upon the fault, but to the fact of their having brought rocks of a different degree of induration against each other, and in which case one weathers so much more rapidly than the other, that the fault is shown by the process. However, there are a large number of faults, particularly out in Railroad Valley——

The Court: I meant in this immediate vicinity.

893 A. And through the country that show their scarps by reason of very large displacements. The fact that the Siebert Fault is a different fissure from the vein, or any part of the vein fissuring is indicated by the difference of angle of striale upon the fault and the vein; the stringers upon the Siebert Fault have an average course in the vicinity of north sixty east; the striale on the vein, conform, wherever I have seen them, with the course of the nose or crest of the anticline, are to the south of east.

Mr. Lindley:

Q. Speaking of this disintegration on the surface of the fault, as it form- scarp,—do I understand you to say that is where the rock on one side is harder than the other—that disintegration on one side is more rapid than the other?

A. That is what I——

Q. That is to say that the rocks were not homogeneous, and for that reason they left a scarp or line which could be observed on the surface?

A. That is one way scarp can be seen, long after the displacement upon the fault has ceased.

Q. But where the fault is in homogeneous rock, and the rock is the same on both sides, the action of the weather acts on the whole at the same time,—there is no scarp there?

A. That is true of faults of moderate displacement; faults of very large displacement, such as those that form mountain ranges throughout this country, sufficient time has not elapsed since their formation to eradicate this scarp.

Q. But in instances we have under consideration here, considering the position of the fault and the enclosed rock, what have you to say with regard to the elimination of the line of faulting, so far

894 as scarps are concerned?

A. The Siebert fault being a flat fault, would be a fault, if all of its scarp were in evidence still, would leave a flat surface and a large part of its surface was originally in Fraction dacite breccia, or in altered volcanic rock, and the eradication of the com-

paratively flat slope was probably accomplished during the process of formation of the fault.

Q. Well, that is all that you have to say about the Siebert Fault, illustrated everything that you think of in regards to that?

A. I think that it covers my conception of it.

Q. Now, with reference to the western termination of this vein—this vein terminates on its westerly course against what?

895 A. Terminates against the fraction dacite breccia cap rock.

Q. Can you briefly give us the genesis of that cap rock, and the geological circumstances under which it was placed in its present position? The character of the rock, in the first place?

A. The Fraction dacite breccia is what is called a pyro-clastic rock. It is a rock which had its origin from violent ejection from a volcano. A portion of it probably fell upon the ground in the way in which it is now found. Other parts of it show evidence of having been mud flow and the whole formation is an accumulation of ejectementa from a volcano which came in its present position through more than one kind of action.

Q. Call it fragmental rock?

A. It is a fragmental rock, P*ryo*-clastic. A portion of that formation which occurs within the boundary of the West End claim lies upon a comparatively steep slope, which dips or slopes rather to the south west. As we follow the vein along the levels or follow up raises put up along the vein, or in cases follow upward along the stopes constructed from the vein, we come against the termination of the vein where it is buried and covered up by this fragmental rock. The line at which this occurs is shown pretty well upon the model, Plaintiff's Exhibit 2, and crosses both side lines of the West End claim in a direction of about north 12 degrees west.

The character of the edge of the vein where it comes against the overlying pyro-clastic rock is such as to leave very little doubt,

896 in fact no doubt in my mind, as to its nature. That is the outcrop upon this hillside of the West End MacNamara vein, as it occurred before it was buried by the Fraction dacite breccia. The usual evidences of an outcrop, such as oxidation, the presence of float, and the broken character of the vein are evidence in every place which I have seen in this vein in contact with the breccia. They are as evident on the 600 level as they are on the 300 level and the stopes above it. From this outcrop the vein departs in a direction sloping to the south east. From any point upon the outcrop, a line drawn in the direction either of the local dip of the vein at that point, or of the general dip of the vein lies within the vein; or in other words, one can follow out further upon the 500 level than you can upon the 400 level, and farther upon the 400 level than you can upon the 300 level before it comes to this terminal edge of the vein against the breccia.

Q. Speaking of this float, this float is found embraced within the overlying Fraction dacite breccia?

A. There is—this float occurs along the old surface under the Fraction dacite breccia, the old slope down which the vein cropped in previous ages, and *it* also found for a moderate distance above that

slope embedded in the Fraction dacite breccia. The Fraction dacite breccia, however, at its base is slightly different from—has a slightly different appearance from what it has further out into the mass of the formation, as out along 300 West End, and represents in many places the actual old soil.

Mr. Dickson: The actual what?

897 A. The actual soil or ordinary detrital accumulation along the old surface before the breccia *case* out upon it. So we find this float from the vein not only upon the Mizpah trachyte underlying the vein, and along its slopes, but also to a moderate distance out into the Fraction dacite breccia, which at these points represents, as I stated, the old soil.

Q. I hand you a sample, which you may mark "Searls' Exhibit 9," and ask you whether that would represent anything that you have described in reference to the inclusion in the Fraction dacite breccia of a segment of float?

A. I have marked this specimen, "S. 9." It represents the character of the float which is found along the vein along the terminal edge of the vein against the breccia, and the rock in this instance, is made up of some fragments and of a mass of finer material which is probably originally small fragments of Mizpah trachyte. And imbedded in this as an old soil, since kaolinized, we find the fragment of oxidized quartz entirely similar to the oxidized quartz which occurs attached to the vein at its edge or apex.

Q. Do you know where that sample came from?

A. I do not.

Mr. Lindley: I will tell you, if you would like to know, Judge, without putting another witness on the stand. I saw it in place last night, and under our directions, it was cut out by Mr. Fox and brought up here.

Mr. Dickson: You can state what place it came from.

Mr. Lindley: It came from the face of the 300 level, the Western termination—where the red ends on the model. Some little
898 distance from the terminal edge, a short distance. Take the witness.

Cross-examination.

Mr. Dickson:

(Q.) It is true, generally, is it not, Mr. Searls, that all fissures opened by any forces or stresses of nature seek the line of least resistance?

A. I think that is true, but that question involves also a consideration of the direction of the stress, as compared with the line of least resistance. I would not say that a stress at right angles to a plane of comparatively easy resistance would follow that plane.

Q. No, I do not mean that. Imagine a force, some force of nature that has opened a fissure, and in the direction in which the force is operating to create the fissure as a fissure is opened along that course, we will suppose it approached closely to a line of lesser resistance—strike that out. If you have a fissure opening along a

course, which course came near to a line of contact, which line c
contact between different rocks would afford a line of lesser resistanc
than that in the homogeneous rock, would you not expect that th
fissure would depart from its course through the homogeneous roc
and take up the line of lesser resistance found at the place of co
tact between different rocks? I do not know whether I make my
self clear or not, but I think you understand what I mean.

A. I think that would be true if there were not a larg
899 angle between the primary direction of fissure and the dire
tion of the plane of resistance which you have supposed.

Q. Anything near approaching parallelism?

A. For instance, if there were a hump, a roll of any kind, a fissu
might follow that as a split in a stick of wood will follow around
knot. It would not perhaps depart from its previous course at
very large angle to follow that.

Q. Well, I am not taking very large angles. I do not mean whe
there is a very large angle, necessarily, in order that it might depa
from the homogeneous rock, which it had traversed in part and tak
up and follow thence the plane of contact.

A. I think that is a question of the nature and direction of th
stresses, as referable to the direction of the plane of weakness whic
you have supposed.

Q. Well, ordinarily, the plane of contact between different roc
would afford a line of less resistance to a fissure opening than th
homogeneous rock would, would it not?

A. I think that is true, particularly in the volcanic rocks of th
region.

Q. It is those we have to deal with here. This fissure or the
fissures in which this vein or these two veins is found traverse i
part a homogeneous rock, cut through it in their downward cours
as well as their longitudinal course?

A. They did, yes sir.

Q. What is your explanation of the fact that the fissu
900 did not follow the plane of contact throughout, but departe
from that line of lesser resistance and took its course onwa
through the homogeneous rock, both longitudinally and downward

A. The explanation of that is found in my previous answer, th
the line of contact at a certain position of longitude in the min
namely, about between sections 8 and 9, took a rather marked di
to the west, so that the——

Q. What did?

A. The line of contact between the West End rhyolite and th
Mizpah trachyte. So that the vein, in following its course throug
out the major part of its extent came to a place where the conta
had a sudden irregularity, a sudden plunge to the west.

Q. Point that out, please? What you have in mind, on th
model?

A. Yes; it is shown about where this line marked "Contact ve
to the north and east," on Plaintiff's Exhibit 1.

Q. Well, I would like you to point it out on the model, so I ca

understand it better. Show where there was any abrupt change in the course or dip of the contact?

A. That is well shown by the cross cuts above from the MacNamara and from the west end sides, running into the footwall.

Q. Which cross cuts do you refer to?

A. I refer to a cross cut in which the figures R 554 occur, on Plaintiff's exhibit 1, and in the next cross cut to the west; the next one to the west, and also one to the east. Now, in the shaft
901 cross cut on the No. 5 level west end, and in the drift running to the west thereof, west end rhyolite is found throughout in the foot wall of the vein.

902 In the cross cut along which the figures 524 occur, Mizpah trachyte is found nearly to the face, and the rock in the face is a little uncertain. And in the other three cross cuts mentioned lying immediately West of those Mizpah trachyte is found so that it is certain that the contact between the West End rhyolite and the Mizpah trachyte, as it continues on its course rising to the west from the Tonopah Mining line, we will say, or from the contact with the glassy trachyte comes into about this longitude, between section- 8 and 9, and there has a rather sudden downward course or dip so that the vein——

Q. Which has?

A. The contact, so that the vein in following upward to the west along this contact came to this irregularity or sudden downward turn of the contact and unable, because of its large area to conform itself to that marked irregularity, and took a course rising to the west through the Mizpah trachyte.

Q. Regardless of the contact?

A. Yes, sir.

Q. Now, coming to the Siebert Faulit as shown upon this Searls Four, what is the angle of the dip of the Siebert Fault as shown upon that section, from which it is represented as having been cut in the sideline raise down to the words 461 Raise on that section?

A. Forty-two degrees.

Q. How much?

A. Forty-two degrees.

Q. In-stead of stopping at the 461 raise take it on down to where it is represented as running—changing from that 42 degree dip to a practically horizontal course, from thence northerly?

A. Thirty four degrees.

Q. What is that?

A. Thirty four degrees.

Q. What is?

903 A. You asked me if I understood you for the dip between the—the average dip between the points where the Siebert Fault was intersected by the side line raise and the point at which it—(indicating).

Q. Yes, that is thirty-four degrees?

A. Yes, sir.

Q. What is the angle of the dip of that fault from thence northerly, as shown upon that exhibit?

A. It passes through a transitional curve, in the immediate vicinity of the bottom of 461 Raise, and departs northerly on a dip of about three degrees or four degrees.

Q. At the bottom of that line of dip, the average of which you have given as thirty-four, the Siebert Fault is in close proximity to the contact in which the vein is found?

A. Yes, sir.

Q. And there, instead of continuing its course downward to the contact and then following along it, it turns abruptly to an almost horizontal——

A. In this section, yes.

Q. What?

A. In this section. The explanation of that is found in the fact that the motion along the Siebert Fault did not occur in the plane of this section, but that the mass of the rock in the hanging wall of the Siebert Fault moved down this way in a direction at right angles with the section—(indicating).

Q. As I understand you, speaking generally this fault, on the surface or where you have it in the highest workings is quite a steep fault, until you get down just over the northerly crest or about the northerly crest of the fold, and from thence on in a northerly course it is flat, perfectly flat?

A. That is the way that it is shown in Mr. Spur's cross sections, and that is the way that it occurs here. I have very few sec-
904 tions which continue this high up upon the fault, to develop that fact.

Q. What deflected it in its dip from a dip of thirty-four degrees for a distance as shown upon that section—what is that distance from where you have it in the side line raise, down to where it is deflected in its downward course suddenly?

A. Three hundred and twenty feet.

Mr. Lindley:

Q. The question presupposes that the movement is in the direction of that dip line?

The Witness: I have not answered it yet, Judge.

Mr. Lindley: All right, go ahead.

Mr. Dickson:

Q. What movement do you refer to Mr. Lindley? The Faulting movement?

Mr. Lindley: Yes, sir.

Mr. Dickson: I am referring to the downward course of the Siebert fault, as we find it to day.

Mr. Lindley: Shown in that direction. But your question assumed a change in the form of the dip, as if the movement had proceeded in that line.

Mr. Dickson: No, I haven't the matter of the movement in mind at all.

Mr. Lindley: I will let the witness answer the question. Pardon

the interruption. Go ahead if you can and answer the question; I do not object.

The Witness: You want me to answer that question, Judge Dickson?

Mr. Dickson: I thought that you had answered it.

Mr. Lindley: No he reminded me that he had not answered it.

The Witness: Will you read the question please?

905 (The Reporter read the last question and answer.)

The Witness: He asked me two questions there at once.

Mr. Dickson:

Q. Does the Siebert fault as it is found in the ground to day have such a sudden deflection wherever you found it along any certain region from a dip of thirty or forty to practically a horizontal course?

A. Neither of these—no portion of the line there shown on Exhibit Searls-4 represents the dip of the Siebert Fault.

Q. Well, we will go to the model. I though- we could get it from that section. As I understand you have the Siebert Fault disclosed in the 488 Raise, to which I now point?

A. We have.

Q. And what is its angle of dip as disclosed in that Raise?

A. About thirty-five degrees.

Q. And approximately the same in the 2-A, 4-A, 5-A, 6-A and 7-A Raises?

A. Slightly flatter there. None of those raises go up on the dip exactly.

Q. Well, what is the true dip?

A. I remember that the true dip in 461 Raise is twenty-nine degrees, and it is approximately that in the others.

Q. Well, now, if it had followed down either in the 4-A Raise on the dip that it had in that raise. or in any of the A series of raises,—it would have been disclosed in the workings below would it not?

A. Yes, sir.

Q. So that it must have flattened very abruptly, or quite a sudden deflection in the angle of the dip or course downward on the Siebert Fault?

906 A. It has flattened that way, and to know that it has flattened one does not have to accept the negative evidence of its being found in the lower workings, because he has positive evidence of its being found in the direction which shows that it certainly has flattened off.

Q. Where?

A. In the 500 Tonopah Mining Cross cut.

Q. Where you have it at the point you have now pointed to in the 500 Tonopah Mining Company's workings, have you it disclosed there on its course, strike or on its dip?

A. It is almost horizontal there Judge,—in a portion of the *our*kings there, it is both on its strike and dip.

Q. If it is almost horizontal, from that one observation alone, it would be disclosed on its strike rather than on its dip?

A. I guess all directions on it—it be- horizontal would be on its strike.

Q. But if from this one observation alone you find that it was in a horizontal position would not the natural inference be that it was there developed on its strike and not on its downward course?

A. I do not see how you can differentiate between the strike and dip of a flat plane?

Q. How do you know that it is flat?

A. You can see it coming in the roof of the drift about fifty-seven feet I think it is—the roof of the cross cut about fifty-seven feet from the drift, and there flattening out so that it occurs in the cross cut for a considerable distance in a portion of that place it is actually flat.

Q. Do you know from that one observation alone where you find it flat, you are not following it on its downward course, for
907 it has no downward course?

A. I don't know which it would be.

Q. You don't know which it would be?

A. The general appearance of the gouge where it shows in that cross cut, is of having a strike across that cross cut.

Q. Do I understand Mr. Searls, that you are unable to say whether or not that Siebert Fault is disclosed in this Tonopah Mining Company's workings,—as it is disclosed, you have it disclosed on its strike or course, as distinguished from its dip or downward course?

A. I am unable to say; it is so flat there that you can call it strike or——

Q. Let us assume that its flat dip—you would have a perfectly flat dip, and you would have it disclosed in the 400 level of the West End, about seventy or eighty feet northwesterly from the McQuillan shaft, haven't you?

A. Yes.

Q. Now take it from that point and give me what would be the dip necessary to carry it from there to where you find it in the 500 Tonopah Mine workings, where in the last place it is found on its dip—what would be the angle of the depression?

A. That would be a depression almost in a line that would depart very little from the strike of the fault; it would not be anything like its dip.

Q. Well, as I understand you, you don't know where it is revealed in the Tonopah Mining Company's workings,—it is disclosed on its strike or on its dip?

A. No, it comes into the roof of the cross cut as we go to the west.

908 Q. So that from rock, you think that you have it there on its dip?

A. It is on its dip. You come from a point under it and intersect it, but it is so flat at that particular point where it is intersected, that you cannot take a careful observation of its strike or dip.

Q. You have it disclosed in another place in the 500 T. M. workings?

A. No.

Q. That is another fault?

A. Yes.

Q. What is the strike of the Siebert Fault from where you have it in the 488 Raise to where you have it just a little above the bottom of the Raise in station 1220-A?

A. About north 52 west.

Q. Does that in your judgment represent the strike of this fissure between those two points?

A. Yes, between those two points.

Q. Now, taking that to represent the strike between those two points, and assuming that where you have it in the 500 Tonopah Mining workings, to be there disclosed on its dip, what would be the angle of dip necessary to carry it over from its strike between the 488 Raise, and the raise in station 1220-A?

A. The dip should be noted at right angles to the strike.

Q. Yes, the dip should be noted at right angles to the strike.

A. I could figure it out more carefully than to measure it on this model.

Q. Very well.

A. An angle whose tangent is fifteen over 160; about six degrees.

Q. Six degrees?

A. Yes.

909 Q. Now, Mr. Searls, am I to understand that notwithstanding the places where you have observed the Siebert Fault in the 488 Raise, in this 621 Raise, and in the 2-A, 4-A, 5-A, 6-A and 7-A Raises, and where you have it in the raise nearest the station 1220-A, and again in a cross cut running out from that about midway to its height, and again in 466 Raise near its top, and again in the A-Raise, on Defendant's Exhibit, and the 200-A raise on the Plaintiff's—and again down in the 500 T. M. Tonopah Mining Company's workings,—and with all your observations as to the course or strike of the Siebert Fault, and its dip in the various places as you have observed it, that you are unable to say whether where encountered in this 500 T. M. workings—you are unable to say whether it is there encountered on its strike or on its dip?

A. I think that your question implies a difficulty which does not exist. There is no doubt about coming out from the vein, out along this cross cut and intersecting the Siebert Fault, there from a point underneath it, so that only in that sense it intersects it as it comes down, because they come from underneath it and intersect it; but the fault at that particular place is so flat, that it would become a matter of considerable uncertainty to place a stick across that drift and take the strike of the fault at that place; there you could not see, at what angle for instance, the cross cut coming out to that point made with the true local dip of the fault at that point.

Q. So I am correct in my understanding, that notwithstanding all of the place at which you have observed it, and have observed its course or strike or its dip, that you are unable to say whether

910 you encountered it on its strike or it- dip in the 500 T. M.

A. The answer that I have just made is correct.

Q. Well, are you unable to say,—yes, or no?

A. I am able to say that I encountered it, yes—I am able to say

that I encountered it from underneath and, therefore, upon its downward course, but I am not able to say at what angle the line along which I walked to encounter it make- with the local dip of the vein at that point.

Q. Do you think that you encountered it there on its local dip; that that is the local dip where you encounter it there?

A. Yes.

Q. And to carry it from the point 70 or 80 feet west of the McQuillan shaft in the 300 level, over to this place where you now say that you believe that you encounter the Siebert Fault, would require an angle of depression of six degrees only?

A. Yes. The angle of depression between the points you mention, which is the point marked on Plaintiff's Exhibit-1 as 1335-A and the point in the Tonopah Mining where the fault is intersected, is not six degrees. It would be less than six degrees.

Q. Well, what would it be?

A. It would be not over two degrees.

Q. Not over two degrees—almost horizontal. What deflected it in its downward course from forty degrees in the 488 Raise and twenty-seven degrees in the 4-A and 5-A Raises, to a dip of two degrees from the horizontal?

A. I don't know that anything deflected it at that point; it is a crooked fault, and the reason for the curvature of the fault, both on the strike and dip is something that I do not know all about; I rather suppose that the harder rocks underneath has something to do with it.

911 Q. The harder rocks underneath where?

A. The West End rhyolite and foot wall rock generally, trachyte, glassy trachyte.

Q. Is that any harder there than the contact at the crest of the fold, where you find the Siebert Fault tangent to the crest? The same rock?

A. The same rock, in a similar way, the Siebert Fault out in this country where it flattens is tangent to that body of harder rock revealed as it — at the top of the fold.

Q. Going to your Searls-4, you have the Siebert Fault pursuing its course downward from the place where it is cut in the sideline raise, to the point just now marked in lead pencil, X-1, on Searls-4 on an angle of thirty-four degrees?

A. Yes.

Q. It is followed down there from the 461 raise down to "X-1" practically on the crest of the roll and particularly further down the northerly slope?

A. Yes.

Q. Now, was it suddenly deflected from that course of thirty-seven to two degrees?

A. It there changes it- course of direction, the downward course as shown on this section. It changes its angle of dip in the downward course.

Q. It changes the dip in the downward course?

A. Yes, sir.

Q. Now, have you observed anything in the ground in that there, or easterly or westerly, or northerly or southerly, which would account for such a sudden deflection of the downward course of that strong fissure?

A. Here are hard rocks underlying the vein in the foot wall, and here is Midway andesite with the contact, which was probably in about that position before faulting took place, along which
912 the fault probably followed, and has followed for a large portion of its area.

Q. We have the hard rock on the contact vein from 461 down to X-1, and that did not deflect it at all apparently?

A. There is no West End rhyolite under 461 Raise, until you get thirty-five feet below. The contact is well on the foot wall side of the vein.

Q. From there on north, from the point where it is suddenly deflected in its downward course, at the point of deflection, it has not come in contact with the rhyolite at that point of deflection?

A. It does not follow that contact, but it does very nearly conform,—and it is my belief that it does conform with the contact, between the Midway andesite and the Mizpah trachyte, because this fault exists a long distance to the west on that contact, and for a large portion of its course above and to the west of that is on the contact; that contact along there is a plane of easy motion, to which it may have accom-odated itself.

Q. But taking the whole distance from the top of the 461 Raise down to the point X-1, you have Mizpah trachyte which did not deflect the Siebert Fault in its downward course. What did deflect it when it got down to X-1; is there anything observable in the ground that you can say would account for such a deflection in the downward course of so strong a fissure?

A. That includes as I said before the other component of motion of the Siebert Fault—the relation of the motion along that fault to whatever particular initial planes of weakness, there may have been in the ground, and in considering that relation we must consider not only the relations either of the strike or dip of the vein,
913 but also in right angles to the plane of the section, and a plane parallel more nearly with the dip of the fault. In other words, this explains only a portion of such a relation.

Q. See if we cannot get at it in another way. Where you have the Siebert Fault disclosed at various places you have mentioned, for four or five hundred feet westerly of the east end of the West End claim, as I understand, you, where that Siebert Fault ceased to be practically tangent to the hanging wall of the north dipping limb of your vein, it is suddenly deflected from its course, northward, all along that three or four hundred feet. Is that true?

A. Flattens out in a line approximately——

Q. A sudden deflection?

A. Yes, rather sudden.

Q. Very sudden considering its dip above and the flatness with which it must have gone off from there almost to where we find it in these raises; it must have been a very abrupt deflection?

A. If you will look all along the model so as to get the true relation of the dip of the fault to the northeast, that deflection will be very much in evidence, very much less marked than as first appears in the section.

Q. Well, whether six or nine or ten degrees—is in your judgment, and the fact that you have not found it in the *ow*rkings below, in that vicinity, there has been a sudden deflection of the downward course of that vein shortly below the bottom of these raises in which it is disclosed?

A. It is not a vein, but I know that there has been a deflection or flattening of the dip.

Q. I used the word vein inadvertently. A sudden deflection in the downward course of the Siebert Fault?

914 A. There is a flattening of the dip along that axis, yes. I do not know——

Q. Now have you observed anything in the groun*f* that would account for such a sudden deflection in the downward course of so strong a fissure?

A. All of the relations which I have observed in the ground are portrayed upon the model and upon the sections.

Q. Well, tell the court, what, in this region, this four or five hundred feet from the east end line of the West End claim westerly where there is the sudden deflection of the downward course of the Siebert Fault,—what you have observed there that would afford any explanation of that deflection?

A. It does not occur to me that it is a matter that needs any particular accounting for. With a trough shaped fault you have a displacement in the direction of the curvature of the fault.

Q. That is like fissure veins, or fissures that have become veins, will follow the general law of following the path of least resistance?

A. With the reservation that we made when you asked me that question,—yes?

Q. What is there where we have the sudden deflection according to your judgment, in the downward course of that fault, the Siebert Fault, that made the course which it had been following when you had it in the tops of these raises, down to the bottom and below, which made that path from there on down a harder one to follow and a more difficult one to get through, than the path which it had followed from the top of the raises down to the point where it makes the sudden deflection in its downward course?

915 A. I think that is very evident upon this section. The fault if it had continued down in the plane of this section with the downward direction which it had in the plane of this section, would have had to cut through not only the hard massive quartz vein which is found at that point but also the hard west end rhyolite which underlies it.

Q. But it was deflected before it reached the hard vein, and skidded along the top of the vein as tangent to it, and then when it ceased to be tangent to it it was deflected in its downward course before reaching the hard vein or hard rock, wasn't it?

A. It certainly was. It does not throughout the more northerly

part of that section coincide with the hanging wall of the vein. That is a point of observation.

Q. Several feet beyond the point of deflection. Isn't it a fact Mr. Searls that one of the main reasons or fact, going to make up your opinion, or leading you to the conclusion that there is any such flattening of the Siebert Fault in its downward course, is the fact that you do not encounter it in the workings beneath, where you should encountered it and would have encountered it if it had not changed its downward course?

A. I think that if the West End company had shot that round of holes, in 533-A, it would not need any negative evidence.

Q. Well, we will come to that later on.

The Court: Where is 533-A?

A. We are having 533-A and 537 continued upward with the exception of coming into the Siebert Fault above the hanging wall of the vein, as there disclosed now.

Mr. Dickson: And the workings at the present status, is it not one of the main factors in leading you to the conclusion that the Siebert Fault has so flattened in its downward course, is because you
916 do not find it where you should have and where you would have found it had it continued downward on the course where you had observed it?

A. That is a large factor, yes.

Q. The Siebert Fault is a strong fault, a large fissure?

A. Yes.

Q. Extending for a long distance, and in that distance longitudinal, and in your judgment will extend for a long distance downward?

A. I think there is no question about it.

Q. Now, has there been movement upon the fissure—not the Siebert Fault fissure, but upon the fissure in and along which the ore bodies of the north dipping limb of your anticlinal fold are found?

A. Has there been movement?

Q. On the walls of that fissure?

A. Do you mean prior or subsequent to the mineralization of the vein?

Q. Well, first generally. Has there been movement?

A. There has been, yes.

Q. Are you able to say, that while there has been movement of the walls of that fissure, that there has been no movement thereon since the vein was formed?

917 A. I am able to say that since, if you mean since the vein was so formed, since its mineralization was completed?

Q. That is what I mean.

A. Yes sir.

Q. Why?

A. The vein is mineralized with quartz in large quantities.

Q. Yes?

A. And the quartz accompanies the pre-mineral fissure of the vein, follows it closely.

Q. Yes?

A. And the pre-mineral fissure of the vein is frequently observable in that quartz as the silicified gouge, thoroughly replaced gouge, and the fact that no motion has occurred along that gouge and fissure since the formation of the vein is evidenced by the fact that there is no crushing of the quartz in the immediate proximity of the fissure.

Q. Suppose there had been movement on the fissure, the vein fissure in and along which the ores on the northerly limb of this anticlinal fold lay; after the deposition of the mineral, after the veinification had been completed, there had been movement along the walls of that fissure; would it not grind and crush to some extent the ore lying along the hanging wall of the fissure?

A. I think it would, and since this fissure, pre-mineral fissure occurs in the vein, in the middle of the vein and not on the hanging wall of the vein, the fact that such movement has not occurred along that primary fissure is attested by the fact that no such crushing is found along the walls of that pre-mineral fissure.

Q. Fissure veins, after the mineralization has been completed, are subject frequently—give evidences of having been subjected to subsequent movement?

918 A. Yes sir.

Q. That is often the case?

A. During mineralization, and subsequent to mineralization at times.

Q. Apart from any subsequent mineralization, when the mineralization was completed, fissure veins in many instances, demonstrated from facts observable, that there has been movement along the walls of that fissure?

A. Yes sir.

Q. Subsequent movement?

A. Yes sir.

Q. And such subsequent movement would have the effect of disintegrating or crushing to a greater or less the rock underlying the moving hanging wall, if it was the hanging wall that moved, wouldn't it?

A. That is so, and the absence of that within the vein proper on the north limb of the anticline is my reason for saying that no such subsequent movement occurred here.

Q. The absence of what?

A. Of the phenomena that you just referred to.

Q. You find the ore crushed in these regions?

A. Yes sir, under the Siebert fault.

Q. Under what you are pleased to call the Siebert fault?

A. That is not ore, however.

Q. What?

A. That is not ore; stringers of quartz.

Q. If you have any objection to the use of the word ore, we will eliminate that. The stringers of quartz there are found crushed in places, in those raises?

A. They are found sheared off and cut off by the gouge.

919 Q. They are found—the quartz has been crushed up and

broken to some extent, at least, and that must have been due to some movement, and you say it was due to the movement along the plane of the Siebert fault fissure?

A. Yes sir.

Q. And it could not have been, that crushing or breaking could not be referable to any possible movement that could have taken place on the hanging—along the hanging wall, the hanging wall as relative to the foot wall of the vein?

A. Well, if it had, I would expect it to follow the hanging wall of the vein itself and go over in 569, 571 and 573 raises, and not shoot off into the country rock above the vein.

Q. But you find it going up on the same plane of the dip, the same angle of dip as the hanging wall below, do you not?

A. Well, it shows——

Q. The raises go up on the same angle of dip that your vein below occupies?

A. Yes, except that the hanging wall partakes of the flattening which you called my attention to on the Section Searls 4.

Q. How is that?

Mr. Lindley: The raise don't go up on the dip of the fault, Mr. Dickson.

Mr. Dickson: They go up on the dip of the vein, though. I do not care anything about this fault at present.

Mr. Lindley: Well, I know you do not.

Mr. Dickson: For these questions, I mean.

920 The Court: We will take a recess now. The case is continued for fifteen minutes.

(Recess of fifteen minutes taken).

The Court: Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Mr. Dickson: Just read the question—Mr. Searls, pay attention to the question and answer that you have given. Read the question and answer to the witness.

(The reporter read the last question and answer.)

Mr. Dickson:

(Q.) What flattening do you refer to, the flattening of the Siebert fault?

A. No sir. I say that the raises go up in a general southerly rise—a general rise to the south, in the same direction as the hanging wall of the vein below, and to the north of that point, except that the hanging wall of the vein to the north partakes of a flattening of the dip, such as that to which you called my attention in the case of the Siebert fault.

Q. Do you not believe, Mr. Searls, from your observations in this district, surface observations, as well as underground observations, that since this vein that is here in controversy, or these veins, as we contend, were completely formed, mineralization completed, that this immediate section of the country has been subjected to strong, intensive earth disturbances?

A. It certainly has.

Q. Certainly has. Very intense, you should judge?

A. I should judge they had, except that I do not know of any large faults within the mine under discussion.

921 Q. I am not speaking of faults, but the earth's crust where these mines are situated and in proximinty thereto and considerable distances therefrom. In you- judgment, the crust of the earth there has been, since the completion of the mineralization of this vein, subjected to intense disturbances?

A. I think it has been subjected to disturbances, and the reason for so thinking, of course, is the occurence of faults within the mine, and the size and number of the faults are, in a rough way, indicative of the amount of stress to which that particular block has been subjected.

Q. Yes, and in addition to that, if you are correct in your conclusion that the westerly terminus of this vein, or terminal edge, as you refer to it, was once an exposed surface, if it had been eroded away, laying bare the top of that terminal edge——

A. Yes sir.

Q. Since that time, since that erosion took place, there must have been some great volcanic eruption in the close proximity to that terminal edge in order to deposit what you call the Fraction dacite breccia, must there not?

A. That depends upon what you mean by a close proximity?

Q. I do not mean to confine you to that edge, but in close proximity, within a mile or so?

A. I would not say that.

Q. Well, then, ten miles?

A. Well, that is probable.

Q. Yes, that is probable. Don't you think that that subsequent volcanic section, intense as it must have been to have covered this country the depth it has with its outpouring from its mouth of lavæ and other material, must have intensely disturbed the
922 country in which this mine is situated, shaken it from end to end and top to bottom?

A. It seemed to me that the disturbance to which any block of ground is subjected from *distance* sources is indicated by the amount of faulting that is found within the block.

Q. Well, that is not entirely a satisfactory answer to my question; not satisfactory to me, if it be to you.

A. Will you read the question again?

Q. No, I will put it again: the volcano out of which was vomited what you call the Fraction dacite breccia occurred after this vein was formed?

A. Yes sir.

Q. And the veinification completed, mineralization completed?

A. It certainly did.

Q. Certainly did. Now, whether that volcano was within a mile or ten miles of what is now marked, located at the West End mining claim, do you not think that its effect must have been to have

disturbed intensely the vein found in the Mizpah and shaken it from top to bottom and end to end?

A. I confess that I would be unwilling to attribute any part of the disturbances found in this vein to the particular volcano from which the particular Fraction dacite breccia came. I suppose there is some connection between the volcanic activities and the faulting in this region.

Q. You say that it is probabe that the volcano is at least within ten miles of this vein?

923 A. I should think that was probable, I am not certain.

Q. If, then, within ten miles of it, don't you think that the necessary result of that volcanic force or eruption must have been to have shaken this vein with tremors from *to* t-p bottom and end to end?

A. I am probably not quite clear as to what you mean by the extent of shakings; do you mean it produced earthquakes?

Q. Earth tremors, of the region occupied by this vein; violent earth tremors.

A. I suppose locally that there were earthquakes in this region at that time.

Q. Well, don't you think there would be earthquakes, and earth tremors of great violence resulting from that volcanic eruption in the region in which this vein is now found?

A. I think that is a matter of a good deal of speculation.

Q. You think that you might have a volcano such as that within ten miles of where that vein is situated, and have no earthquake that would shake this ground in which the vein is found?

A. To what extent do you mean shake, you mean dislocate, and break the ground?

Q. I do not care whether it breaks it or not, there would be great violent earth tremors, wouldn't there?

A. I suppose there would be earthquakes.

Q. And do you think that that violent disturbance could have taken place along the region in which this vein is now found without any movement upon the walls of that vein?

924 A. I think that any earthquakes that would be attributable to a volcano ten miles away would not affect the vein in the least.

Q. You think it would not affect it at all?

A. No, I do not *not* think it would affect it.

Q. That it would be quite natural, in your judgment, to suppose that we could have had a volcanic eruption like that, this way, or this way, and it would not set up earth shocks that would cause any movement upon the walls, either wall of this vein?

A. I am familiar with the site of the shock of one very violent earthquake, and know that it does not affect the rocks, the hard rocks a hundred feet from it.

Q. But where you already have an opening in the rock, fissure in the rocks, and you have violent earthquake shocks, extending through that fissured zone, wouldn't you expect that there would

be movement upon all the fissures, more or less, produced thereby?

A. I think, Judge, you have cause and effect mixed up there.

Q. That may be.

A. I think that the faults and dislocations which have occurred in this block of ground would set up earthquakes but I do not think earthquakes that were set up ten miles away would cause dislocations or fractures of the vein.

Q. I am not confining you to faults or dislocations particularly? Do you not think that the necessary result of such a volcanic force energy as that would be to violently disturb the section of the ground in which this vein is found? I understand you to say yes to that.

925 A. I do not say yes to that.

Q. You say no to that?

A. I think it would produce tremors and earthquakes, perhaps.

Q. But nothing of sufficient violence to move any of these fissures, one wall upon the other, to any degree whatever?

A. I think that would be very unlikely.

Q. Very unlikely?

A. Yes sir.

Q. Well, we will go over to Goldfield for a few minutes, if you will put up that section. What is its number?

A. Searls No. 1.

Q. Is the vein that you there have that you have delineated in part upon Searls 1, a fissure vein, or a contact vein, or what?

A. It is a vein that as far as its mechanics of formation goes, is very similar to this vein here.

Q. Is it a fissure vein, or what?

A. It is a fissure vein to the extent that the vein minerals follow a fissure.

Q. Has it, in your judgment, a top, a terminal edge, apex?

A. Yes sir.

Q. Is this portion of the sketch to which I now point, running from X down—put Z here, for me: from the line of work represented here from X to Z, are you following there on the dip of your vein from an apex?

A. That section is not parellel to the true dip of the vein.

Q. Well, is it following down either in the true dip of the vein, or angling across it, I do not care about that?

926 A. Yes sir, it is following down it.

Q. Departing somewhat from the true dip?

A. Yes sir.

Q. And just beyond Z, or between Z and B, you have a picture representing an anticlinal fold?

A. Yes sir.

Q. In the downward course of that vein?

A. Yes sir. That exists in the ground.

Q. If we were to cut off, had eroded away all of the vein in its downward course from X to Z, would your opinion be that then that vein had not top or apex?

A. It would be my opinion that no top or apex was exhibited in that section.

Q. How is that?

A. It would be my opinion that no top or apex was exhibited in that section.

Q. All right. We will suppose that we had that condition from end to end of the mine. We will suppose that it was a thousand or five thousand feet long, as you went down, you have the evidences as you have on this section. You have now on the section which you claim to recognize as the top or apex of your vein, and you are following on its dip; from its apex down to Z. Now, we will suppose that condition prevails throughout the whole length of the mine, so far as developed, and then assume that from X to Z, not only on this section but every section that could be taken along the strike of the vein had been eroded away, leaving in the exhibit what is shown here from Z up to the point B, and thence on down to Y,
927 would it be your judgment that that vein had no top or apex?

Mr. Lindley: One moment: that is a question of law.

Mr. Dickson: I have a right to his conception of that.

Mr. Lindley: As to whether a man can start and follow up on a vein depends altogether upon whether there is a local curve on the vein, or a local feature. That is a question of law.

Mr. Dickson: No doubt about that. But when witnesses are brought here to tell us where the top is, or where it is not, of course, it is legitimate to find out in cross-examination what their conception of a top is.

Mr. Lindley: I never asked the gentleman where the top or apex of this ledge was. I will allow you all the latitude you want, only I simply want to protest that this is not legitimate examination, that is all. You can go ahead, if you see fit.

Mr. Dickson: I think the question is proper, if the Court please. Just read the question.

The Court:

(Q.) You remember the question, don't you?

A. Yes sir. I will explain that the approximate scale of this diagram will be about 250 feet to the inch, and with that explanation, I should say that under the conditions that you have specified, that there would be no top or apex to that vein. No apex to that vein. I remove the word top. No apex to the vein.

Mr. Dickson:

(Q.) Do you make any distinction between the word top and apex?

A. Yes sir.

Q. What?

A. I understand by the word apex the top edge.

928 Q. And by the word top, you understand what?

A. I think there could be a top of something without having a top edge.

Q. Suppose you had an anticlinal fold, Mr. Searls, at rock strata,

we will say, that the flanks or sides of the anticline stood at an angle of 45 or 50 degrees, and you were asked what, in your opinion, was the top of that anticlinal fold; what would your answer be?

Mr. Lindley: That is obvious.
Mr. Dickson: Well, I want the witness' answer.

A. The crest of the anticlinal fold——
Q. Would be the top of the fold?
A. Yes, the point where the dip changes.
Q. But if there were a vein following up the two sides of such anticlinal fold and uniting along the crest of the fold——

Mr. Lindley: That is two veins.

Mr. Dickson:

(Q.) Two veins. Well, I put it that way, first, two veins. Suppose there were two veins, one ascending along the—assume that the strike of this anticlinal fold was easterly and westerly—and that on the north dipping limb of the fold there was a vein extending throughout its entire length, and following from the dip upward to the crest of the fold, and on the southerly dip of the southerly limb that we had another vein following up that limb of a crest and there uniting in ore, continuous ore over the crest of the fold. If I understand you, you would say that the top of the anticlinal fold—the crest of the anticlinal fold was the top thereof; your opinion would be that the crest of the anticlinal fold would not there be the
929 top of either of the veins?

A. There are so many suppositions in that question, which I take exception to, that I do not think the question is capable of being answered by me. For instance I think if two veins came up the legs of that anticline and united in continuous ore, that you would very likely have one vein.

Q. Well, would it have any top, in your conception of the word top?

A. It might have a top in this way: that most anticlinal folds in the earth's crust are not horizontal, their axes are not horizontal. They plunge in one direction or the other. And if I were coming up the limb of such an anticline and wanted to reach the highest point in the vein, I would follow up the axis of that anticlinal fold upward along it to reach the higher points.

Q. But in order to ascertain where the top of the anticlinal fold itself was, you would not do that? You would take the crest of the fold?

A. Yes, I would follow up along the anticlinal fold, if its plunged, to find the highest point.

Q. To find where the top of the anticlinal fold was?

A. Yes.

Q. Well, were you mistaken when you answered the question a little while back that if it had an anticlinal fold and the sides of which were sloping at an angle of 45 or 50 degrees, you were asked where the top of that fold was, that you said at the crest of it?

A. I understood the way you hold your hands, that you referred to a horizontal anticline; an anticline whose axis was horizontal.

930 Q. If the crest of the anticline then was not absolutely horizontal—if it was dipping or declining—its course being easterly and westerly,—it was declining towards the east at any appreciable degree from horizontality, if you were asked where the top of that anticlinal fold was, you would not say the crest of it?

A. No, it seems to me obvious that if you were asked where the top of the fold was, if you would follow up on it you would get to the top when you could go upward no further.

Q. Will you hand me that specimen of fraction dacite breccia please? What is its number?

A. S-9.

Q. You understand now where that came from?

A. Yes, I do.

Q. About ten feet or so westerly of what you call the terminal edge of the vein?

A. Yes.

Q. Out in the Fraction dacite breccia?

A. Yes. I would explain here that a point ten feet out in this direction in the 300 West End where it enters the Fraction dacite breccia, would be only a short distance above the old surface underlying the Fraction dacite breccia, for the reason that the old surface lies at a very sharp angle to the direction of that drift.

Q. Nevertheless you have in the present surface as you go out into that, the Fraction dacite breccia?

A. Yes.

Q. How steep it is out here two feet or five, of course you don't know?

A. I have a very good means of making an estimate.

Q. Well, how deep do you think it is out ten feet from the terminal edge of that level?

A. About two feet.

931 Q. Have you taken any means to determine it?

A. Yes, the small block model.

Q. Have you put down any workings to determine its depth, ten feet out?

A. Not at that particular point.

Q. That is the point I am speaking about.

A. In the whole development of this surface, as exhibited on Plaintiff's Exhibit No. 4, shows the major slope of the old surface buried by the Fraction dacite breccia.

Q. If it is buried by the Fraction dacite breccia that may be some indication of what the old original slope was, but it would be an imperfect indication of what the depth of the breccia was, wouldn't it, ten feet away from the terminal edge?

A. Not very imperfect if you consider the course of the 300 drift at this point, where it goes out into the Fraction Dacite breccia. It is obvious that at a point ten feet from the apex of the vein the old surface would be a short distance below the floor of the drift.

Q. Can we safely assume that the present topography of the surface of the Fraction dacite breccia is exactly conformable to the old surface over which it flowed?

A. I do not think you mean what your question said.

(Question read.)

Q. Is this intended to represent the top of the Fraction dacite breccia?

A. No, sir.

Q. What is it intended to represent?

A. It is intended to represent the top of the surface covered by the Fraction dacite breccia.

Q. Well, the bottom then or base of the Fraction dacite breccia would be conformable to this old surface. I can understand that.

A. Yes.

932 Q. But would the top of the Fraction dacite breccia be also necessariiy conformable to the old surface?

Mr. Lindley: That is the present surface?

Mr. Dickson: No, the old surface, before the outflow of the Fraction dacite breccia.

A. You can go out in the west end of the claim, by the hospital there, and see what the top of the Fraction dacite breccia looks like.

Q. Suppose that we have for ten feet or twenty feet west of what you call your terminal edge, on the old exposed surface,—suppose there had been a gulley down there twenty feet deep, subsequently when the Fraction dacite breccia flowed out over that country it would fill that gulley, wouldn't it?

A. Yes.

Q. And the depth of the Fraction dacite breccia ten feet out westerly from the westerly terminal edge of this would depend upon just what the old surface was, whether it was even in its slope, uneven in its slope, rolling or what-not, wouldn't it?

A. Yes, but this model represents it very closely in a general way, the slope of that old surface.

Q. How do you know the slope of that old surface?

A. It has been explained.

Q. This is the top of what?

A. The top of the Mizpah trachyte surface in the foot wall of the vein.

Q. It is impossible to determine it. There has been no attempt to determine it, whether it was even and gradual in its slope as represented there or not?

A. It is fairly well determined by the exposures in the ground, as it was pointed out in the explanation of this model.

Q. Nobody can see it?

933 A. See a great many points on it.

Q. Cannot see it anywhere west of the terminal edge of what you call the vein, can you?

A. Yes, sir.

Q. Is the old surface still exposed?

A. Yes.

Q. Uncovered by any of the rock here represented?

A. Yes.

Q. And uncovered, not covered at all, by any of the Fraction dacite breccia?

A. You can see it where workings project into the breccia from underneath.

Q. And that would be only local points, the size of the working only?

A. Yes, but there are a number of such points.

Q. And those workings are run out in the Fraction dacite breccia?

A. Yes.

Q. And they do not expose the old surface?

A. Yes, they do where they cut into it.

Q. Where, give us some one place where they expose the old surface?

A. 166 raise,—136 Raise at its top and the 136 intermediates shows the old surface sloping down this way for a considerable distance, and at the top of the 166 raise where the intermediates comes in to the top of the 172, the end of the 195 intermediate, the end of the red paint, on the 300 level and the stope immediately above that point; the tops of several raises from the 400 level, and the end of the 300 and 600 levels.

Q. The places that you are pointing to except one here, are from 100 to 150 feet easterly of this so-called westerly terminal edge, aren't they?

A. No, sir.

934 Q. You have the old surface you say exposed in the 136?

A. Yes.

Q. Is it exposed also in 242?

A. Yes, in 252 it is exposed where it is followed down by the Siebert fault, forms the back of the raise.

Q. Would it at present appear there was a sudden declination there of the old surface?

A. Yes, there is, caused by the faulting of the Siebert Fault.

Q. Now coming — the Searls-9, assuming that the old surface was covered at the place where this sample was taken for a depth not to exceed two feet, as you estimate, I will ask you to explain to the court what you call the old soil that is found in that specimen?

A. A close observation of the entire specimen shows that it is made up of fragments; there is one around there dimly outlined, and here are some in here, a number of small fragments, so that the whole fragment of rock is made up of a large number of small particles obscured by the effect of kaolinization later on.

Q. Point out the old soil in the specimen?

A. The whole thing.

Q. The whole thing is old soil?

A. Yes.

Q. If the old soil was there covered to a depth of even two feet with the Fraction dacite breccia, how do you account for the old soil being embedded in the breccia itself, two feet above the old soil?

A. Would you please read the question?

(Question read.)

A. I evidently did not make myself clear. I include within the term Fraction dacite breccia such old soil as existed on the surface, when the breccia covered it.

935 Q. I know, but I understand you to say that in your judgment that at the point where this sample was taken, the Fraction dacite breccia may have had a depth of two feet over the old soil?

A. Including in the term Fraction dacite breccia the old soil.

Q. Is this Fraction dacite breccia or is it the old soil?

A. I think that it is old soil.

Q. It is not Fraction dacite breccia at all?

A. I include within the term Fraction dacite breccia, the old soil, because they are indistinguishable.

Q. Well, when you said the old soil, it might have been in your judgment at that point buried.

A. I did not say the old soil, I said the old surface.

Q. Don't you include the old soil as a part of the surface?

A. No, I did not.

Q. When you said the old surface you meant the bed rock?

A. Yes.

Q. And the old soil which is found in this, may have lain above the bed rock?

A. That is what I meant, yes.

Q. And it became mixed up with the Fraction dacite breccia, and became a part of it?

A. That is what I meant, fine fragments.

Q. Speaking generally, the Fraction dacite breccia is made up of fragments isn't it?

A. Yes.

Q. Some coarse and some very fine material?

A. Yes.

Q. Some as fine as powder?

A. Yes.

Q. Away long distances above the old surface?

A. Yes, but particularly in the vicinity, immediate vicinity of the old surface you find an abundance of fragments of Mizpah

936 trachyte and float quartz, which indicates that the fragments in that particular portion had an origin in the immediate vicinity and from the rock that immediately underlie that portion of the territory.

Q. And when you have an exhibition or fact observable of a boulder or piece of trachyte included within what you call the Fraction dacite breccia, surrounded by it on all sides, how do you account for its getting there; if the dacite breccia was poured out after that vein had been eroded, how do you account for quartz in that vein, or from that vein, and the trachyte in which the vein is found being now found in the midst of the Fraction dacite breccia and surrounded by it on all sides?

A. Well you find the phenomen- to which you refer, namely the occurrences of fragments of quartz, and of Mizpah trachyte in that portion of the Fraction dacite breccia that immediately overlies the old surface, and that portion of the Fraction dacite breccia is formed by and represents the old detrital, accumulation of the old surface; in addition to that you find occasionally a fragment perhaps of Mizpah trachyte at some distance out from the old surface, at least a good many feet, supposed to be referable in fact much of this material did not fall in the place which it now occupies as ashes, but as a result of mud flows and accumulations of that kind.

Q. But, apart from the mud flow do you not find out in what you call the Fraction dacite breccia, some considerable distance from the terminal edge, not only the vein trachyte, but quartz, or what you believe to be quartz of this vein, ansolutely embedded in the Fraction dacite breccia?

A. I have seen such fragments out to the distance of as much as thirty feet, on this 300 level which would represent a point a
937 few feet, perhaps eight or ten, above the actual bed rock of the old surface and I believe such fragments represent just as this particular fragment of quartz represents the fragments that rolled down there into the old detrital material that covered the surface and the line of demarcation between the detrital material and the material which is more thoroughly of a volcanic nature, and referable to ejectementa; it is not a sharp line or one that you can pick out.

Q. What would be the depth about of the Fraction dacite breccia, thirty feet out from that terminal edge?

A. I don't suppose more than seven or eight feet.

Q. Assuming it to be seven or eight feet how would you account for finding quartz of this vein altogether surrounded by and embedded in the Fraction dacite breccia, which overflowed upon its surface?

A. I would account for it that that portion represents old detrital accumulations on that slope, and that a boulder or fragment of quartz worked down that surface from its former position upon the apex of the vein.

Q. But still it would rest not on the surface, but on the top of the soil?

A. Yes.

Q. And if you had a specimen of it, of either the quartz or of the vein lode trachyte out there, not only overlayed with the breccia, not only had breccia on its side, but underlayed by the breccia, how did that breccia get under it, as it poured out over the country, so as to envelop it?

A. I think that portion of the breccia that underlies it was not poured out, but represents detrital accumulations on that slope before that was poured down.

Q. It was not breccia at all?

938 A. It is breccia all right.

Q. Of course this specimen, I know, thirty feet out there

could not have been held in suspension while the Fraction dacite breccia poured out over it and covered it up as in an envelope?

A. I should say not.

Q. It was not in the position of Mohammed- coffin?

A. No, sir.

Mr. Dickson: If your Honor please I would ask for an adjournment at this time.

The Court: I would like to ask one question.

Q. How do you account for the kaolinization which appears in that particular section?

A. Kaolinization is a process which takes place in rocks by the decay of the felspars which are contained in them. It is a process which is used to—usually referable to weathering action, and I suppose that the kaolinization in this rock represents the decay under the action of the atmosphere of these little fragments that formed it at the time when it was exposed to the atmosphere.

Q. And that would be what, the trachyte or the other?

A. That would be—it consists of fragments of trachyte and quartz in it.

Mr. Dickson: When this was first presented to you Mr. Searls in direct examination, didn't you refer to it as a specimen of Fraction dacite breccia, and not as the old soil?

A. I think that I very likely did, but I have at all times thought of the Fraction dacite breccia, as embracing the old soil which covers the surface and also embracing the mud flows and other pyrocastic accumulations that occur within it; comprehensive terms.

At this time an adjournment was taken until ten o'clock A. M. December 19th, 1914.

939 SATURDAY, December 19th, 1914—10 o'clock a. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Cross Examination of FRED J. SEARLS, Resumed.

Mr. Dickson:

(Q.) Mr. Searls, will you be good enough before we start the examination to put up Searls 4.

A. (Witness does so.)

Q. The last subject about which you were being interrogated was Searls 9, the breccia?

A. Yes sir.

Q. Just what do you refer to, or what have you in mind when you speak of the Fraction dacite breccia?

A. I have in mind all of that formation which overlies the bed rock of Mizpah trachyte and outcrop or apex of the West End MacNamara vein at its terminal edge in the west end of the West End and MacNamara claims. I include in that a portion of detrital ma-

terial, of old soil which overlay that surface, and various forms of volcanic accumulation, all of them fragmental or pyro-clastic.

Q. Well, the soil that lies above the old bed rock, if there were any there before the outflow of the Fraction dacite breccia, was poured over it, do you include that soil lying between the bed rock and the subsequent flow of the Fraction dacite breccia as being a part also of the Fraction dacite breccia?

A. I do, yes sir. The Fraction dacite breccia, I think is
940 not to be considered as a formation which accumulated in a moment or in a brief space of time. Its accumulation was probably gradual, and I think it would be difficult, or impossible to point out a line or plane which would mark the surface of the old soil or detrital material which overlay the bed rock of Mizpah trachyte and the outcrop of the vein, and the point where the accumulation became entirely that of volcanic ejectementa.

Q. Have you any knowledge of the depth of that old soil that laid over the bed rock at the time of the outflow or outpouring of what you call the Fraction dacite breccia?

A. As I have just stated, I do not think that the top of that old soil is a definite or sharp line. I think that portion of the bottom of the accumulation does represent old soil, as shown by the fact that it is composed largely of fragments of the Mizpah trachyte, and of fragments of quartz float which——

Q. At all events, if I understand you, you include within the term Fraction dacite breccia all of the old soil that lay above the bed rock, no matter what its depth may have been?

A. I do, yes sir.

Q. Now, this Searls 9, we will say, shows evidence of kaolinization?

A. Yes.

Q. And the decay or degradation of the feldspar in it; and that you say would be caused by atmospheric influences, or weather influences?

A. It is caused by atmospheric influences, yes sir.

941 Q. Therefore, that specimen 9 which was referred to by *your*, first, as I understand it, as Fraction dacite breccia, in view of the evidence—it has been broken. In view of the evidence of the dacay of the feldspar caused by weathering atmospheric influences, that must have been exposed there a long time before it was covered with the true Fraction dacite breccia, must it not, in order that that process of kaolinization could have proceeded to the extent that is manifest in that specimen?

A. I think that the time of the accumulation of the old soil is probably comparable to that of the accumulation of the soil upon the surface at the present day.

Q. I am not speaking of the time of the accumulation of the old soil, whatever there may have been there at the time. But this Searls 9, from the evidences of degradation of the feldspar, decay evidence, that must have — exposed to the weathering influences a long time before it was covered by the volcanic ash or outflow, which I have always understood up to this time was what was included and all that

was included within the term or phrase Fraction dacite breccia? That must have been exposed, this Searls 9, before it was covered up by the Fraction dacite breccia proper?

A. In point of years, a long time, yes sir.

Q. This model, the block model—just put one part on. That is Fraction dacite breccia, that block, that portion?

A. Yes sir.

Q. Now, when we lift that Fraction dacite breccia off, do you understand that the surface underlying that westerly of what
942 is shown on this model in red and intended to represent what you call the westerly terminal edge of this vein, is that intended to represent the old surface or the bed rock under the surface?

A. It is intended to represent the bed rock.

Q. Well, how could you get at and determine approximately, even conjecturally what, the shape, contour of the surface of that bed rock was, not knowing the depth of the old soil above it, what it may have been?

A. Well, the——

Q. It is a pure matter of conjecture at best, isn't it?

A. No sir.

Q. Well, how do you get at it?

A. The line at which the detrital material, the old soil or volcanic ejectements comes against the bed rock of the Mizpah trachyte, or against the outcrop or apex of the vein, as the case may be, is not conjectural at all. It is a very sharp, clear line that you can put your hand or pick on. But the top of what was the old detrital accumulation, where it merges with the more purely volcanic accumulation is not a distinct, sharp plane. In every exposure of the old surface, the line at which the bed rock ceases and the fragmental accumulation begins is very sharp.

Q. Where have you the bed rock, the surface of the old bed rock exposed in that portion shown on this model west of the Westerly terminal edge, what places?

943 A. Referring to Plaintiff's Model, Exhibit 2, it is shown in the 136 intermediate.

Q. How far is that easterly of the terminal edge of the vein, so called?

A. About fifty feet; in the 166 and 172 intermediates, where the apex of the vein can be seen projecting into the detrital accumulations, a little way. In the 185 intermediate where the actual surface west of the apex can not be seen because the Fraction dacite breccia, was here brought down by a small fault; in the No. 3 level, the 300 level of the West End at the end of the Red paint on the model, end stope 4, the edge of the vein against the breccia may be seen, and also portions of silicified Mizpah trachyte. In the tops of the various raises here painted yellow in the 500 and 600 western extremities of the West End Company's working.

Q. Some of them easterly and the other westerly of what you call the terminal edge of the vein?

A. Yes. The *The* whole number of the exposures giving quite satisfactorily the position of a slope to the southwest.

Q. The places that you have pointed to would seem to me to be going out on a level in the Fraction dacite breccia, not showing the slope of the old underlying bed rock?

A. The slope—the southwesterly slope is largely seen at points above the vein and east of the exposure of the terminal edge or apex of the vein, and at the point where the vein apices against the breccia, taken in conjunction with those exposures to the east shows the surface to have a southwesterly,——

Q. Oh, no.

A. By putting these exposures on a map and drawing contours through the points exposed, the surface can be arrived at very satisfactorily.

Q. Well, if it is satisfactory to you it is not to me, just at present. Speaking for a moment again of the Siebert Fault as depicted
944 upon Searls 4—have you any opinion as to the direction of the course that opened that fissure, whether it was side pressure, or what, lateral pressure?

A. I know that the line of action of the force was in a direction of about north sixty east, but how——

Q. Fissures are sometimes opened by lateral pressure?

A. Yes.

Q. Do you think that this was so opened?

A. That would be a pretty difficult question to answer. I do not think that I know enough about it to venture an opinion.

Q. Well, do you think that that fissure was opened so that it grew from its top downward, opened from its top downward, or opened from depth upward?

A. I think that all fractures have a point of beginning.

Q. Where do you think that the point of beginning was here, at the top or at the bottom?

A. I don't know judge, but I would venture an opinion that it was somewhere in the axis of the *of the* trough of this trough-shaped fault.

Q. Where have you the fault fissures disclosed, if at all, as represented upon Searls 4, between the points where it is encountered in the sideline raise and the point X which you marked on this exhibit for me yesterday,—at what points intervening have you it exposed?

A. Have it exposed throughout the length of the 461 raise.

Q. Between the top of the 461 Raise and where it is encountered in the side-line raise, it has not been disclosed by any workings?

A. No, except that the 2-A raise a short distance to the west of this section develops it for a distance further up on its dip.

945 Q. How far would that raise, if it were projected onto that map—just show us where it would fall; project it at right angles, of course, to the plane of section.

A. It would fall in the vicinity of the letter "F" in the word "fault" the projection being, however, a distance of more than one hundred feet.

Q. You were speaking yesterday of a raise found almost vertically beneath the 5-A raise?

A. Yes.

Q. You speak of finding quartz in that raise?

A. There is quartz in that raise, yes, sir.

Q. And you said that it stood vertically, the quartz did?

A. One prominent stringer that I happened to recollect most clearly stand- in a vertical position, the others stand in various positions.

Q. Did you make that additional qualification yesterday, or did you say that you simply found there quartz that stood vertically?

A. I made that additional statement.

Q. Maybe, I don't recollect. The rocks, the quartz found between the north dipping and the south dipping limb of your anticline, and beneath this crest of the anticline—much of that stand- in a vertical position does it not, and is along a north and south fissure, cracks or seams?

A. That is not true.

Q. Not at all?

A. There are exposed on the 400 level and on the 500 level a few places where quartz is seen in the West End rhyolite in a nearly vertical position, but the quartz exposed in the 569-571 and the 573 raises followed by those raises in its anticlinal form from a southerly dip over the roll to a northerly dip, practically all lies in the direction of the workings, and is clearly seen banded and having a
946 course and dip in the direction of that working.

Q. Do you wish to be understood as stating the result of your observation to be, that they are not the places where you have quartz in very considerable dimensions lying between the hanging wall of the north dipping and the hanging wall of the south dipping limbs of your anticlinal fold, to a depth of thirty or forty feet from the crest, and the structure of which quartz is vertical in places, others dipping slightly to the east and others dipping slightly to the west, with innumerable or a great many north and south fractures, cracked seams?

A. There are, in the block underneath the crest of this anticline, vertical stringers, the same as there are in the rock above in the hanging and foot wall of this vein everywhere, but the large masses of quartz there do not stand vertically. The structure and banding of the quartz may be seen just as clearly as any place in the mine to have a flat and rolling form, and the vertical cracks which cross it, and which to the casual observer give it the appearance of quartz standing vertically, are post mineral, and have no relation whatever to the direction of the quartz in these raises.

947 Q. What caused the post mineral cracks in that little intervening space? Why do you say they were post-mineral?

A. I say they are post mineral because they very clearly cut the structure of the quartz, which when one picks it off clean, may be seen lying in approximately a horizontal position. And in places dislocates the quartz slightly, as shown by the little faulted segment underneath the west end 400 level on the section G, Searls 4. You asked me two questions there, Judge.

Q. Go ahead.

A. You asked me what caused those post mineral*s* cracks, did you not *not*? Will you read the last question, please?

Q. (The reporter read the question.)

A. The portion of the answer which I have already given refers to the question why do I call them post mineral. As to what caused them, I am not very certain. There are certain of these cracks seen in the 400 level, in the vicinity of the McQuillan shaft, where the Siebert fault is developed, which look as though the Siebert fault, in dragging when the motion occurred, dragged the heavy hanging wall block of ground downward, tore the quartz apart a little.

Q. Dragging down what block of the hanging wall?

A. All of the rock above the Siebert fault. By hanging wall rock, I mean rock above the fault. That as it moved down over the quartz appears to have torn it apart slightly and formed little vertical fissures. I think also, however, that some of the north — south fissures, developed are not different from other small faults in the mine, and possibly have their origin from volcanic disturbances.

948 Q. Then, the result of your observation, is *it* that there is no place between the north dipping and south dipping veins or vein out for a distance of 20 or 30 or 40 feet below the crest of what you call a roll where, if his Honor were to go there, he could observe that that intervening quartz stood structurally from a vertical to a slight easterly and slight westerly dip with north and south fissures running through it, and that that would be generally—the general observation? The general characterization?

A. That is true. The north and south fissures which are there exposed, in very many instances, cutting the quartz so that it appears to a casual observer to stand vertical are post mineral cracks, and they have nothing to do with the direction of the quartz vein there exposed.

Q. But to the non-scientist, the appearance would be that it stood vertical and was traversed by those north and south cracks?

Mr. Lindley: I suppose by that you include the casual observer?

Mr. Dickson: Yes, the intelligent observer.

A. I can answer that best, perhaps, by exhibiting again the photographs, Searls 2 and Searls 3, and stating that in the directions that we run in the following of these, or in the following of the vein in these raises, that the miners were simply told to follow the vein, and they followed it.

Q. What?

A. I say that in directing the work of making these raises, the miners were told to follow the vein and they followed it.

949 Q. How do you know?

A. How do I know? Because the vein is continuously exposed in the drift. For instance, in the 569 raise, we started off from the 537 raise——

Q. I do not think all of that detail is necessary, Mr. Searls.

Mr. Lindley:

(Q.) I understand this is worked out by the West End Miners under your direction?

A. Yes sir; and those were the directions given.

Mr. Dickson: I did not understand that.

The Witness: You asked me what a non-scientific observer would——

Q. Would it require a scientist to discover that this apparent vertical, or practical- vertical dip or structure in the intervening country referred to in previous questions, with its north and south fissures was—that that appearance was misleading?

A. It is not misleading.

Q. That it did not represent the truth to the -ye?

A. It is not misleading.

Q. Read the question.

(The reporter read the question.)

Mr. Dickson:

(Q.) And did not represent the true facts to the eye, the true conditions?

A. It did represent the true facts, and it would not take a scientist to discover that; all that it would require is a broom and some water to wash off the quartz and show which way it was standing.

Q. So that the true explanation of the conditions and
950 appearances as worked out by the scientists, would be likely to be overlooked by the non-scientific, intelligent observer?

A. I did not state that.

Q. Well, isn't that true?

A. I think it is not true.

Q. Well, you said that it would have the appearance that I have suggested to the casual observer. Don't you include in the casual observer a man of ordinary intelligence, good eye sight——

A. A man of good sight and ordinary intelligence examining this quartz carefully would see very clearly that it lies in a flat direction.

Q. This vein that you have denominated to be one vein is not a typical fissure vein, of course? It has been enlarged, or the vein has been enlarged by the replacement of the rock by solutions which probably had their channel of circulation through the fissure, isn't that true?

A. Yes, the enlargement having taken place as shown in the sections D, Searls 4.

Q. To what extent has the process of replacement extended into the foot wall country of the south dipping branch? Give us the maximum? I do not mean up near the crest of the fold, so called, but apart from that?

A. I think that a partial replacement of the west end rhyolite under the south dipping limb of this anticlinal vein may have proceeded to a maximum distance of perhaps 50 feet.

Q. And from that down——

A. There may have been stringers and branch veinlets
951 that extended even farther.

Q. And from that down to a minimum of what?

A. I have never seen any section or exposure of the vein where silicification has not proceeded from the original fissure for a distance of 10 feet at least.

Q. To what extent, maximum extent has the foot wall country of the south dipping limb been replaced to a degree that would make it commercial ore?

A. Commercial ore?

Q. Maximum?

A. I think I have never seen any commercial ore more than 15 or 20 feet under the fissure zone.

Q. And from thence on, as you went into the foot wall country, it would gradually fade out?

A. That is true.

Q. And what is the minimum distance from the fissure in the foot wall country so far as you have observed it, to which it has been converted by replacement into commercial ore?

A. There are, of course, portions of the vein in the fissure itself which is not commercial ore.

Q. I am not speaking of places like that, but where there has been a replacement of the foot wall country that converted the foot wall country into ore of commercial value. What would be the minimum distance from the fissure where you have observed such condition?

A. There are portions of the stope shown on the Section Searls 4, under the Eureka west end line where the fissure lies approximately along the foot wall of the stope, so that it is presumable that commercial ore did not extend below it.

952 Q. Now, are there places where there is commercial ore for a short distance only below the fissure?

A. Yes sir.

Q. And made into commercial ore by replacement?

A. That is true.

Q. How short a distance? The minimum?

A. The minimum would be zero.

Q. What?

A. The minimum would be zero?

Q. I did not hear.

A. The minimum would be zero feet.

Q. That would be where there had been no replacement at all. The foot wall country had not been converted into ore at all by the process of replacement. Now, I want you to give us the minimum distance to which the foot wall country, according to your observation, has been by replacement converted into commercial ore?

A. I think that that distance would vary from nothing all the way to the figures that I gave you before. You object to the zero feet, I will say a half a foot.

Q. Do you find a like replacement of the foot wall country on the hanging limb of this so called anticlinal fold?

A. I do not understand the question.

Mr. Lindley: North dipping, you mean?
Mr. Dickson: North dipping limb?
Mr. Lindley: You said hanging limb.

Mr. Dickson: Well, I should not have said that. Do you find that the foot wall country underlying the hanging wall of the north dipping limb of this fold or roll has been replaced,
953 mineralized by solutions, probably coming through, having their channel, their fissure on the north side?

A. Your questions referring to the south dipping limb, refer to the fissure along which the vein is formed. You now ask me a similar question, referring your question to the hanging wall of the north dipping limb. Do you mean that?

Q. Is the foot wall country, and I mean by the foot wall country, the country immediately beneath the hanging wall of the north dipping limb replaced any at all? Mineralized by the solutions coming through some channel of circulation?

A. Through a large portion of the area of the north dipping limb, the rock immediately under the hanging wall of the north dipping limb would be above the primary fissure.

Q. Would be above what?

A. Would be above the primary fissure. In other words, the primary fissure does not coincide with the hanging wall entirely.

Q. Well, is the foot wall country, the country underlying the hanging wall of the north dipping limb replaced? Has it been replaced by solutions ascending through some channel of circulation?

A. Yes sir.

Q. To what extent has the foot wall on the north dipping limb been so acted upon, maximum and minimum?

954 A. The replacement of the footwall country underneath the vein fissures on the north dipping limb has proceeded for distances that are entirely comparable with those existing in the south dipping limb.

Q. Now, has the work or process of replacement extended into the hanging country above the south dipping limb?

A. The south dipping limb?

Q. Yes.

A. Yes.

Q. To a degree a degree at all comparable to which the foot wall country of that limb has been effected by replacement?

A. To somewhat large degree as shown in this section "Searls-4" the entire West End 600 winze, overlies the main fissure of the vein and has been replaced largely with quartz, so that it now comprises a portion of the vein, and this replacement had extended up into the 712 cross cut, so that portions of that cross cut show a mass of quartz and ore which make it commercial ore, in a commercial part of the vein. The same is true of the same stope in the same section in the vicinity of the Eureka-West End line.

Q. Now, the workings that you refer to in the first portion of

your answer, where you have the 712 cross cut,—that country there lies between the Fraction vein and the main—what is called the main south dipping vein, does it not?

A. It does, yes.

Q. And that cross cut and the country in that vicinity is very much broken and fractured, isn't it, even much more so than the general fracturing found along this vein from end to end?

A. No, I don't think the fracturing as widened by the appearance of quartz stringers in the 712 cross cut is unusual at all; such replacement and fracturing is found in a great many places throughout the mine.

955 Q. Will you point to some other places where you find the hanging wall country replaced, mineralized, as you describe the footwall country as being replaced and mineralized?

A. Yes.

Q. I will withdraw the question. Just strike out the last question. Will you point to the places where the hanging wall country rock has been replaced, mineralized, at points where there has been no fracturing in the hanging wall country, through which the solution could have made out, and probably did make out, if at all?

A. The mineralizing and replacement of the country rock in the hanging wall proceeds through the medium of little fractures and fissures that proceed out into it.

Q. And in the foot wall country that is mineralized in many places where there is no cracks in it at all, isn't it?

A. No.

Q. Where the whole body of the foot wall country has been mineralized—I mean the whole body for a considerable distance, easterly and westerly and downward?

A. That is not true.

Q. What is not true?

A. Your statement.

Q. What part of it is not true. I am not making a statement I am asking a question.

A. I know of no places in the mines here where there are large bodies of mineralized rock in the footwall of the vein, that are not attributeable to the proximity of the fractures or fissures, either of the vein itself or extending out from the vein.

Q. Do you wish to be understood Mr. Searls as stating that the result of your observation is, that the hanging wall country of the south dipping vein has been replaced generally, to an extent

956 comparable to the replacement found in the foot wall of that same vein?

A. I think it is to a greater extent, slightly.

Q. To a greater extent?

A. Yes.

Q. That is true also, I suppose, of the hanging wall limb——

Mr. Lindley: Hanging wall limb, judge?

Mr. Dickson: The north dipping limb.

A. That is true also, but in that portion of the north dipping

limb, where the Siebert fault is tangent to the north dipping limb, the evidences of this replacement, namely, the little veinlets and stringers, which proceed out from the vein has been scored off and carried away so that for those portions of the vein it is not in evidence.

Q. Apart from the territory practically in the immediate vicinity of what is shown upon Searls-4 section of the 712 cross cut, I wish you would point to some workings in which would be found veinlets or seams of any considerable thickness, disclosed?

A. I will point to several such.

Q. Very well.

A. The 429 cross cut——

Q. Shown on the model?

A. Shown on the model, from which the 429-B raise is put up, is full of stringers of quartz.

Q. What dimension what thickness?

A. Up to a foot or two feet in thickness,—and the 429-B raise from that cross cut shows a great many such stringers.

Q. There is only one represented on the cross sut in the model?

A. That is not—the detail of those stringers does not purport to be represented upon this model; it would be impossible for so many of them. The stope portrayed on the section-G which is in the vicinity of the Eureka-West End line, very nearly its entire part overlies the fissure of the vein, and there has been so many
957 stringers of quartz and ore in that which they have been stopeing for commercial ore—the trachyte portion having been sorted out. The entire end of the 400 level, from 461 raise to the west end line of the West End claim.

Q. What end line?

A. The east end line of the West End claim,—are full of stringers of quartz comparable in size and extent to those found in the 712 cross cut. The raises such as the one that goes into 5-A and one not shown on this model—there are two raises shown there, and the 5-A, that are full of quartz stringers, the one in the footwall going from the B—up to the A stope, are probably sixty percent quartz occurring as stringers in the trachyte.

Q. Stringers of what thickness?

A. Up to two or three feet in thickness. The cross cut from the three hundred level of the MacNamara—intermediate cross cut, above the 300 level of the MacNamara, near stope-11, slightly east of it, is a net work of stringers of quartz in the hanging wall of the vein.

Q. Indicated on the Defendant's model at all?

A. No, sir, but the cross cut is full of them.

Q. Any considerable dimensions?

A. Yes, so much so that the rock in the cross cut contains thirty or forty percent quartz.

Q. Do you know why these so-called stringer- are not represented upon the model, in a place os such importance?

Mr. Lindley: That is according to the question of view point; you

must not presume that it is important unless it is in support of a particular theory.

Mr. Dickson: If for that whole distance it is sixty per cent
958 in quartz, it would be a natural assumption that it was important.

A. This model, Defendant's Exhibit-2 does not purport to represent the occur-ences of all of the hanging wall stringers in the mine; it would be impossible to represent them with even approximate accuracy on such a model.

Q. But it does undertake to represent a few of them?

A. It represents some of them?

Q. And only a few of them?

A. Yes.

Q. And were those few represented because they were more prominent than the others not represented?

A. No, sir.

Q. All right. What is the average thickness of this vein, the south dipping limb first?

A. The average thickness.

Q. Yes. Including the replacement to the extent that it has been converted into commercial ore, at all events.

Mr. Lindley: Is that determined by the stope line?

Mr. Dickson: No, it may not have been stoped out to the limits of commercial ore; I do not know.

A. Do you mean by the thickness of the vein, the thickness only of commercial ore bodies in the vein?

Q. They pay ore that could be worked at a profit if you had all the facilities and economic treatment—or put it this way: Including in rock all that you would recognize as ore, whether it would be pay ore or not; I do not mean whether it might be traced the fraction of an ounce, what you would call ore, what would be the average thickness of the south dipping limb of this vein, about?

A. I think that the average thickness would probably,—you mean within the ore body? Of course there are portions of the vein where there are no pay ore, but within the ore body I should say
959 that the average thickness would be in the neighborhood of from fifteen to twenty feet.

Q. And the average thickness in the same sense of the north dipping limb?

A. Within the ore bodies I think that it would be of a very similar thickness of from fifteen to twenty feet.

Q. Has not the vein on the north dipping limb, as you go easterly, so far as commercial values are concerned, has disappeared hasn't it recedes?

A. No, sir.

Q. Does it carry commercial values of any magnitude in the easterly portion?

A. When the West End Company drove the 571 winze for us, they sent part of the rock from that to the mill.

Q. But speaking of this eastern portion of the north dipping limb of the vein, as compared with the westerly portion of it, what would you have to say; it is practically gone, so far as commercial values are concerned?

A. I don't agree with that entirely; I don't think that it has been properly prospected as yet.

Q. Well, there is some reason apparently that the prospecting ceased. Don't you think that was due to the fact that the vein was so impoverished that it would not justify further work upon it?

A. I have already stated that I did not think so; if I owned that ground I would prospect it—I would prospect that part of the vein.

Q. Well, if you owned it—but evidently the owners did not continue their prospecting in it?

A. They did not.

Q. And you understand that work has ceased in there for a
960 long time; it has been a long time since any work was done in there?

A. I don't think so, when I first got to the mine, the cross cut of the West End under this block of ground, was being extended and upon inquiry I was assured that it was being extended for the purpose of finding ore.

Q. Did not find any?

A. What did you say?

Q. Did not find any?

A. I do not think that there was any commercial ore exposed in those raises; I am not sure of the values there.

Q. Well, on the other hand the south dipping limb of your fold, there is found at the easterly end, as big and as strong as at the westerly end, and as big and strong as the north dipping limb is at its westerly end?

A. That is true.

Q. Large rich bodies of ore?

A. Yes.

961 Q. Will you step to Defendant's model, Exhibit A one moment. I wish you would point out to the Court the Butler 700 level, as shown upon Defendant's exhibit A?

A. This is the level to which I now point, bearing such numbers as 710, W. D. 702, 721, 714.

Q. Well, about this?

A. That 7—can't read that number.

Q. What is this one?

A. 719, 714, 714, 709.

Q. That is 717, isn't it?

A. I give it up.

Q. Well, from station or numbers 718, through 714 and 714 again——

A. 708 cross cut.

Q. And the last numbered near the easterly terminus of that line of work is all in the Butler 700 level, isn't it?

A. It is, yes sir.

Q. Is that line of work driven in this vein, the south dipping limb of this vein, what we call the south dipping vein?

A. It is driven in a portion of that vein.

Q. It is driven in the vein, is it not, throughout that distance?

A. I would say that it—all of those workings lay within the vein, although a considerable proportion of the rock exposed in the workings is not quartz, but trachyte.

Q. Showing that it runs along one limb of the vein, or one boundary of the vein, or closely to it?

A. Showing, rather, a similar condition to that portrayed in
962 the nearby 600 winze of the west end on the section Searls 4.

Q. Well, it is driven in the vein, anyway, for that distance?

A. Yes sir.

Q. And do you think that either boundary of the vein is exposed in that line of work, or that it is near the boundary of that line of work?

A. I think it is all within the vein.

Q. That is as much as you desire to say? You do not want to say anything about a boundary?

A. Well, boundaries are indefinite.

Q. What is the course of that portion of the 700 level? I do not want to guess at it.

A. We *have* a protractor here yesterday, but I do not see it. It — about north 62 west.

Q. All right. The course of the vein or that portion of the vein as disclosed in that level between the points given you is not turning to the north so as to form a toe, but swinging away from that to the south, isn't it? It is not swinging to the north so as to make it form a toe in connection with the vein in the north dipping limb?

A. There is—I do not think either in the working or in the vein exposed there there is any *w*ing to the north exhibited.

Q. Swing to the south in its general course; if that was continued on for any distance, it would not come back and form a toe, or what you call a toe with the north dipping line, would it?

A. No sir. If it continued on its strike.

Q. Calling your attention to what has been referred to heretofore as an annex to this model Exhibit A.

963 A. May I make a little further explanation of that last answer before that?

Q. Certainly.

A. The general anticlinal shape of this vein, as it comes westerly, can be seen on either of the models, or upon Section Searls 4, or any of the glass sections in the model, Plaintiff's Exhibit 3.

Mr. Lindley:

(Q.) Did you mean westerly, Mr. Searls?

A. Easterly.

Q. You said westerly.

A. Pardon me. To be very much flatter at its eastern edge than it is at its western edge.

Mr. Dickson:

(Q.) That is observable by all men who look at the model?

A. Yes sir.

Q. Nevertheless, this vein covers that 700 level to which you have referred to as pursuing a course which would make it impossible, of course, it would not deflect it again and turn to the north and form a toe, with the north dipping vein? There it is pursuing a course away from the course of the north dipping limb of the vein, instead of toward it?

A. Yes, we have there in that portion perhaps a little evidence that this anticlinal roll in the vein is dying out as we come to the east, has become flatter and resuming a more normal condition.

Q. Wel will see about that. How far have you examined this vein easterly of the east end line of the West End claim in any underground workings? How far have the workings extended east-

964 erly from the east end line to the west end line?

A. How far have workings extended?

Q. Yes, 4 or 500 feet?

A. I don't know. A long way. Just east of the east end line of the West End ground is the ground of the Tonopah Mining Company which is explored a long distance to the east.

Q. On this vein?

A. I don't know whether it is on this vein or not.

Q. How far have the workings upon this vein been extended easterly of the east end line of the West End claim?

A. The greatest distance to which I have followed this vein in these workings is on the 600 level of the Tonopah Mining Company in a drift which is also the sill of a stope, and which is not marked with any designated number.

Q. Well, put a number there. The most easterly extension of that vein which you have found?

A. I will put a number 10 there.

Q. Just put an arrow pointing to the number 10 for better identification. You have marked the place you refer to as number 10, with an arrow pointing to it, on the Defendant's model exhibit A, have you?

A. Yes sir.

Q. Do you mean, Mr. Searls, that that is the most easterly point to which you have seen workings upon this vein?

A. That is true.

Q. What do you do with the vein, that portion of the same stope that continues on easterly there for 70 feet, I shoud judge?

965 A. I don't do anything. I have never been in it and do not know anything about it.

Q. Never have been there?

A. No sir.

Q. Have you never been in the stopeing marked on the annex to this model T. Co. for T. Company?

A. I think I have walked around in there once when that stope had not reached the dimensions which is shown it has on that model.

Q. Well, the same stope in which you have marked 10, with the arrow, is shown upon the Plaintiff's model, isn't it, extending on easterly?

A. It is so shown.

Q. Well, you think that to the easterly terminus of that stope it is all in one vein, of course?

A. I have never been in that. Know nothing about it.

Q. Have you been in these workings of the Tonopah Company, shown on this annex in yellow?

A. I have, yes sir.

Q. What?

A. I have walked through on my way to the Desert Queen, yes sir.

Q. Hoe recently?

A. Within the last month. I think so; within the last two months, anywa-.

Q. Would you be inclined from the observations you have made of the stope at the point where you have marked 10 with the arrow, and having passed through the stope marked T. Co. to conclude that the stope marked T. Co. is a stope in this same vein that we have been talking about, or that it belongs to some different vein, or
966 have you no opinion upon that, assuming this stopeing to be as shown upon the model?

A. I think it quite likely that it represents a portion of the same vein.

Q. I understand you to say you have also been through the workings shown in this annex to the model exhibit A colored in yellow?

A. I have walked through there, yes sir.

Q. Have you been—of course you have been along the stopeing colored in yellow on this model near the easterly end line, or both east and west of the easterly end line of the west end claim in which you have found the figures on this model 461, 411 E, and thence on to the easterly terminus of that work shown in yellow?

A. There is no stopeing shown at the points indicated.

Q. I say you have been along that line of work?

A. Yes sir.

Q. That is in the north dipping limb of this vein?

A. No sir.

Q. Is it in the vein?

A. It is within the aura or halo of stringers which go up from the main portion of that vein into the hanging wall.

Q. Lies in the hanging wall. What about this work shown in yellow near the east end line on this model in which the figures 537 are found? Is that in the vein?

A. Yes sir.

Q. That is in the north dipping limb of your vein?

A. Yes sir.

Q. Have you been in this work shown in yellow crossing the easterly end line, the westerly terminus of it being nearly on the east end line of the West End claim, and extending thence for
967 a distance of 50 or 60 feet westerly?

A. Yes sir.

Q. In the form of a stope?
A. Yes sir.
Q. You have been in that?
A. Yes sir.
Q. That is on your north dipping vein?
A. It is on a north dipping vein, which I think has no connection whatsoever with the West End MacNamara vein, except that it may intersect it in depth, or join it.
Q. You have the West End MacNamara vein in the 537 raise, so marked, back to t-is connection with a raise in purple?
A. 537.
Q. Marked 537 also?
A. The 537, yes, and the other marked 537 we call 569.
Q. Well, 537 on this model?
A. Yes sir.
Q. 569 on your model. That is nearly the flat part of it?
A. Yes sir.
Q. The vertical part bein- colored in purple and the nearly horizontal part bein- colored yellow?
A. Yes sir.
Q. Now, is that colored in yellow clear back to its connection with the vertical raise 537 in your north dipping vein?
A. Yes sir.
Q. And yet you think that the stopeing in yellow to which I now point—I will have you number that.
A. Number it 11.
Q. Put an arrow on that, too.
A. (Witness does so.)
Q. Where you state that the working colored in yellow just previously referred to, running out from the 537 raise, the yel-
968 low portion also being marked 537, is in the north dipping limb of that vein of yours, you are of the opinion that the stopeing which you have marked eleven with an arrow pointing to the number, is in another vein?
A. I think it is perfectly obvious on this model that this stope, which is not correctly shown, having a little more of a northerly dip than is here shown, cannot possibly be on the same vein as the flat working marked 537 and painted yellow is.
The other vein obviously on this model underlies it, and if any further evidence were needed to be sure that the vein in the stope marked 11 is a different vein, it is furnished by the fact that the vein in 537, being the West End MacNamara vein, lies on a contact of the glassy trachyte and Mizpah trachyte, whereas this steeper dipping little vein of a size and width that is almost insignificant in comparison to the extent of the others, is in the Mizpah trachyte throughout its distance, and comprises one of several stringers through the Mizpah trachyte which are not shown on the 500 cross cut on this model.
Q. Speaking of its insignificance, it is represented at least as being larger than the vein disclosed in the 537 practically horizontal raise which you say is in your north dipping vein?
A. It is in it, yes sir.

Q. And the vein in the stope which you have marked 11 with an arrow pointing to it, as represented on the model, at least is larger than the vein as you have it in the 537?

A. It is larger than the working, not larger than the vein.

Q. What is the difference between the point where you
969 have your north dipping in the vertical portion of the 537 raise to the westerly end of the stope marked 11?

A. You ask for the distance between the two points. The distance between the two points is 60 feet in a direction almost at right angles to the plane of the West End MacNamara vein.

Q. What is the horizontal distance between the two?

A. 29 feet.

Q. How much?

A. 29 feet.

Q. What is the vertical distance?

A. About 31 feet. The first distance given you was scaled off the model, and the others off the map, so that the latter are more correct.

Q. Now, this working on the annex to the model Exhibit A colored in yellow, and which you say you have been through, is that in the vein? Are those workings in the vein?

A. Yes sir.

Q. Do you think that those workings are in the MacNamara vein?

A. I do not.

Q. Do you think the vein there is an entirely separate and distinct vein?

A. I do, yes sir. My reason for so thinking in—one reason for so thinking is that it lies entirely in the Mizpah trachyte, and another is that it does not conform in strike, dip or position to the West End MacNamara vein.

Q. Do you understand that there has been a north and south faulting between the stopeing shown on this annex and the stopeing shown on the main portion of the model?

A. I believe there has.

Q. Would that account for the difference in their position?
970 A. It would partially account for the difference in position, or might fully account for the difference in position, but not for the other fact mentioned.

Q. Have you been in the working which I will have you mark 12, with an arrow pointing to it, which extends upward, inclining southerly as you go up?

A. I have not. I think I have been up a few feet in the small stope that lies to the north of that, east of that.

Q. The stopeing that you were in going up on a dip to the north?

A. It was. I think you were mistaken in the question or I was mistaken in the answer. The stope goes up to the south, and not to the north.

Q. But it goes up on a northerly dipping body of ore?

A. Yes sir.

Q. What do you mean, Mr. Searls, by the strike of a vein?

A. The strike of a vein is the direction of a line at which a vein

would intersect a horizontal plane at the point where the observation is taken.

Mr. Dickson:

(Q.) What is that? Just read that answer.

(The reporter read the answer.)

Q. What do you mean by the general strike of a vein?

A. By the general strike of a vein I mean the azimuth or direction of a line which connects the extremity of the tracing of t-e vein upon a horizontal plane throughout the extent of the vein through which the general strike is taken.

Q. You have given the strike of this vein in direct as being north 5 west?

A. At a point.

971 Q. At what point was that that you obtained that strike?

A. I don't remember the place in my direct testimony to which you refer.

Q. It was near the westerly edge, what you term the westerly terminal edge, wasn't it?

A. I don't remember it—giving that strike,—I remember giving the course or direction of the apex of the vein.

Q. No; the strike of the vein you gave as north five west. If you do not now recall the place that you then had reference to, I will ask you to give us the course of the strike of the vein, at or near what you call the westerly terminal edge?

A. On each leg, or at which point?

Q. The entire vein both legs?

A. The general strike?

Q. The strike in that locality. My recollection is that it was in that vicinity that you ascertained the strike to be north five west; I want to see whether I am correct or not. Do you remember the place Mr. Lindley?

Mr. Lindley: My recollection was that he was tracing the course of the apex along the vein, and taking in its entire exposure of the north and south leg. I have a vague recollection, however.

Mr. Dickson: I have it in my notes, strike north five west. I may have made a mistake about it.

Mr. Lindley: I am not sure about it. You might turn to the testimony and find out about it. Was that on direct.

Mr. Dickson: On direct, yes.

Mr. Lindley: You are not confusing Mr. Searls' testimony with Mr. Siebert's testimony, are you?

Mr. Dickson: No, Mr. Siebert gave it north fifteen west,

972 and at one point Mr. Searls gave it north five west.

Mr. Dickson: Can you give to the court now the average strike of this vein?

A. I cannot give the average strike of the whole vein because I am not familiar with the whole vein.

Q. Well, give us what you *cal*im to be the strike of the vein at the easterly end line of the West End claim, or in that vicinity?

A. The strike at the easterly end line of the West End claim.

Q. Well, what is the strike of the vein?

A. The strike of the vein at the easterly end line of the West End claim is that shown on the map of the 400 level.

Q. Well, what is it, what is its course?

A. The local strike is from about north sixty degrees east to north sixty degrees west.

Q. Where at the east end line of the claim—or didn't you understand the question?

A. On the 400 level——

Q. What is the general strike or the average strike of that vein, including both its limbs, at, or in close proximity to the east end line of the West End claim? That is what I want.

Mr. Lindley: Well, to get a strike you have to go some distance; if you get a general strike you have to take the extreme exposure.

Mr. Dickson: I say, the general strike in that particular locality. I am not speaking of a point, I say at, or near, and along and in the direction of—I will change that. At or near the east end line of the West End claim, taking in both limbs of your vein, tell the court what the strike of your vein is in that locality?

973 A. We have in the vicinity of the east end line of the West End claim, no continuous exposure on a level of the vein, but on the 400 level, a distance of about 120 feet from the east end line, the strike of the vein is well exposed, as changing from a north easterly, around through every degree to northerly, to north westerly, to as much as north fifty or sixty west; that is the best place to get the strike, in the vicinity of the east end line of the claim.

Q. Has this vein any average strike? Have you been able to ascertain the average strike of the vein?

A. I can ascertain the average strike of the vein within the exposures of it within this ground; the average strike of the whole vein, is a good deal like the average strike of the bottom of a tin can that has had a good many dents put into it.

Q. What is the average strike of this vein, if — are able to give it to us, so far as the vein has been disclosed in all of the workings shown upon the model?

A. About north fifteen or twenty degrees west.

Q. Now is your ruler, as it is laid upon the map upon which model, Plaintiff's exhibit 2 now stands, along the course of the general strike of the vein?

A. Approximately so.

Q. Give it to suit yourself, now. Lay the ruler upon what you believe to represent, in the direction that you believe to represent the average strike of this vein?

A. That is about it (indicating).

Q. Now, I will have you draw a line there,—get it fixed again, have you got it the way that you want it now?

A. Yes, practically.

Q. Now, draw a line, make a little more prominent line than this. That would be obliterated.

A. (Indicating.)

974 Q. Now mark over that average strike of vein as given by Searls.

A. (Indicating.) I have so designated that line.

Q. Give me again you- definition of strike, if you please?

A. Of general strike.

Q. What?

A. Of general strike.

Q. No. Your definition of strike that you first gave.

A. I gave two.

Q. Well, give them again then?

A. I said that the strike of the vein was the strike of the line at which it intersects a horizontal plane, at the point at which the observation is taken; the general strike of the vein is the azimuth, or direction of the line connecting the extremities of the trace of the vein upon a horizontal plane throughout the distance to which the general strike is taken, to the extent of the vein.

Q. The distance to which it has been developed on any given or horizontal plane,—is that correct?

A. Yes.

Q. I will ask you to pass a horizontal plane through the vein on the 400 level, and give us the course of the line of intersection, as you have in your first definition of strike?

Mr. Lindley: Now let us understand each other before we proceed. Please read the last question.

(Question read.)

Mr. Lindley: At what point of observation?

Mr. Dickson: Any point that you select.

Mr. Lindley: Well, that is the element of his first definition, he had a point in observation.

Mr. Dickson: Well, he may select any point of observation that he chooses. My question said under his first definition which was including the first point of observation.

975 A. The north limb of the West End-MacNamara vein extends on the four hundred level to a point considerably beyond, and to the northwest of any exposure that is delineated upon this map, so that the strike or direction of the line——

Q. Which map are you referring to?

A. Plaintiff's Exhibit-1 or any other map in court—so that the direction of a line connecting the extremities of the exposure of the vein,——

Q. Well, that is your second definition, you are now referring to?

A. Oh, you want——

Q. The first definition. Give us your first definition again, so that we won't have any other misunderstanding?

A. The strike of a vein at a point, is the direction of an intersection upon a horizontal plane of the vein at that point. On the four hundred level the strike——

Q. I want you to take in both branches—select a point of observation from which you can give us both veins.

A. The strike at a point near station 123-B on the 400 level in exhibit "Finch-5" is north 44 degrees west.

Q. What is your point of observation selected?

A. Point station 123-B.

Q. Would that include both limbs of your anticlinal vein?

A. It is impossible to take a local strike and include both limbs of the anticline.

Mr. Lindley: You have got to take the second definition in order to reach a general strike.

Mr. Dickson: Can you give the strike of the vein including both limbs as the vein is disclosed on the four hundred level?

976 A. The nearest we could come to it judge, would be to take the strike at the point of the toe of the anticline, where the vein is swinging around from a northerly to a southerly dip, in which case, depending upon the e-act point that you take the observation, you could get a widely variable strike; in the vicinity of the McQuillan shaft, or the drift just south of there the strike is north and south.

Q. Are you unable to give the general strike of the vein, including both limbs of the vein, both limbs of the anticlinal fold, take any place where the two are disclosed on the four hundred level?

A. I am not unable to do so; you have not asked me to do so.

Mr. Dickson: Please read the last question.

(Question read.)

Q. Do you understand the question?

A. Yes; I answered it that I was not unable to do so.

Q. Well, you are able to do so?

A. Yes.

Q. Then please do so.

A. As I started to say, the vein on the 400 level is not developed,—it is developed to an extent, to a considerable extent to the north and northwest of any point exhibited on any of the maps exhibited in court.

Mr. Lindley: I understood the question was, Mr. Dickson, to involve the extremities of the vein as shown on the map, or what is developed in the ground?

Mr. Dickson: The same as it is developed in the ground.

Mr. Lindley: Very well.

Mr. Dickson: Well, can't you carry out the development on the north dipping, here, so as to enable you to give us——

A. I can.

Q. Well give it and then give us the average strike.

977 A. The last observed dip that I have on the West End MacNamara vein——

Q. One moment; proceed.

A. The last observed dip that I have to the northwest and the MacNamara vein is in the vicinity of station N 127, where I have an observation that the vein dips 22 degrees. If it continued on that

dip to the elevation of the 400 level, it would at that elevation be to the north west, nearly north, a distance of 300 feet further. So that by connecting a point on the farthest exposure on the 400 level to that point 300 feet north of station M 128, it would have an approximation to the strike—to the average general strike of the vein as exposed in these workings on the 400 level.

Q. Including both limbs?

A. Including both limbs.

Q. What is it?

A. You want it very closely, Judge, or an approximation within 3 or 4 degrees?

Q. Oh, a degree or 2 won't make any difference.

A. It would be around north 10 or 12 west, the azimuth of that line.

Q. Come to the Defendant's Exhibit D. The map purports to be a map of the 400 level, and give me the strike of the vein as disclosed on that level, from the point in which we find the El, for elevation, 6640, point 4, back westerly to the vicinity of where the McQuillan shaft cuts the vein?

A. There is no vein exposed continuously between those points, so there is no vein that has a strike.

978 Q. Isn't there a vein at the elevation point 6640 on that level?

A. Not as so designated on that level.

Q. Well, at 1226 B then?

A. At 1226 B there is a vein which stands very steeply and strikes about north 45 east.

Q. What vein is that?

A. It is a little stringer in the trachyte, about a foot wide.

Q. Is any portion of your West End MacNamara vein shown as far easterly on this level as that station No. 1226 B?

A. No sir.

Q. No part of it?

A. No sir.

Q. Where is the easterly extremity on the 400 level of the development of this so-called West End MacNamara vein?

A. The easterly extremity on that level is a curve and not a sharp extremity, and is in the working between the McQuillan shaft and——

Q. Just mark on Defendant's exhibit the easterly termination of that vein on that level?

A. There is no easterly terminus.

Q. What?

A. There is no easterly terminus of the vein.

Q. Don't the toe terminate it?

A. No sir.

Q. Can you find the easterly terminus of the vein on that level, on Defendant's map, Exhibit D? If so, point it out and designate it.

A. The most easterly exposure of the vein upon that level

979 is a curved line which runs——

Q. I want that put on with some degree of accuracy, and

put it on with permanent color so we will be able to refer to it, what you call the easterly extremity of the vein as it is shown on that level?

A. I do not call it the easterly extremity; I call -- the most easterly exposure. It is a curved line which I will mark S.

Q. Mark it S on the other end, then, of the curved line.

A. (Witness does so.) Beyond this line——

Q. Wait a moment: does the curve stop at the place where you have stopped the heavy pencil?

A. No sir.

Q. Well, carry it out.

A. It is already shown upon——

Q. Well, I want it shown on this. Do not go any further for my purpose, unless you wish to carry it further.

Now, Mr. Searls, I will have you rub out your little S mark, and put it in another place. Put an S at either end of the heavy curved line in pencil placed on Defendant's map, Exhibit D.

A. I will say in explanation of that line that that represents very approximately the hanging wall of the solid body of quartz where it goes around the toe of the anticline the change of strike is shown.

Q. The strike would differ every inch, or fraction of an inch as you pass around the curve. Is the vein there, as developed on that level, easterly of the easterly edge of that curve?

A. There is in a level to the east of that a great many
980 stringers of quartz which comprise the hanging wall, stringer zone is the hanging wall of the main solid body of quartz.

Q. Are we to understand that in your judgment all that is shown in red on this Exhibit D, and in yellow on this Exhibit D east of this curve you have placed there is in the hanging wall country?

A. That is true.

Q. Has not been stoped?

A. No sir.

Q. What?

A. No sir.

The Court: This case is continued until 2 o'clock this afternoon.

981 Afternoon Session, Two o'Clock p. m.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Cross examination of FRED J. SEARLS, Resumed.

Mr. Dickson:

Q. As I understand you Mr. Searls, none of the work on the 400 level on this map Exhibit-D, easterly of the easterly extremities of the curbed line, that you have placed upon that map, is in the vein. No part of it east of that curve?

A. I do not know what line you refer to, judge.

Q. The line that you placed just before the adjournment, the recess on Exhibit-D, that curved line with the letters S. S.

A. That line represents the hanging wall boundary of the solid part of the quartz of the vein. East of that stringers of quartz varying in size extend in ramifying directions through the Mizpah trachyte.

Q. So, then, is it your understanding or belief, or opinion on all of the workings on that level east of the curve are outside of this vein, not in the vein?

A. I think that a portion of the Mizpah trachyte country rock is so filled with stringers, is properly considered as a part of the vein.

Q. Are those workings east of that curved line, in your judgment in the hanging wall country, all of them?

A. They are in the hanging wall of the solid portion of
982 the vein. A portion of them are in the hanging wall country, so impregnated with stringers of quartz that they can properly, and should properly be considered as being in the vein. To the east of that they are in the country.

Q. Directing your attention for a moment to the model, Plaintiff's Exhibit-2, and to that portion of it westerly from where the section-13 in the glass model is passed through stopes 8 and 9 A, and 8-A and 9, you see the region of the country I point to, I will ask you if the north dipping vein there is not distributed by faulting?

A. It is distributed by faulting.

Q. That is all on that point. Now, at the bottom of the work here marked—what is that number?

A. 658.

Q. Is the bottom of that raise in the south dipping limb of your vein?

A. Yes, sir, well towards the foot wall side of it.

Q. Now, will you give me the strike from that point to the northerly dipping limb of the vein, the deepest workings shown upon the model?

Mr. Lindley: Treating it as a separate vein?

Mr. Dickson: No treating it as one vein.

Mr. Lindley: You said to the northerly dipping vein, what point on that north dipping vein?

Mr. Dickson: That I cannot tell, until you give me the strike.

A. The strike—the direction of a line giving the point at the bottom of raise 658 to the most northwesterly development upon the vein shown upon this model, would represent the strike of the vein.

Q. What is the strike of the vein including both of its branches from the bottom of this raise 658 to the southerly dipping
983 vein? From thence north what is the strike.

A. Read the question please.

Mr. Lindley: Including both north and south dipping veins?

Mr. Dickson: Yes.

(The Reporter read the question.)

A. The local strike of the vein at the bottom of 658 raise is about north and south. The strike—genera- strike of the vein is not different at that point from the point testified to this morning. I feel as though I ought to make a brief explanation that in a vein that is so

irregular as this vein is, that the general strike is a futile sort of a direction. One might just as well ask for the strike of a contour map, or for the strike of the surface of Oddie Mountain, as for the strike of the vein.

Q. Well, I am not now asking this question for the general strike. What do you claim the strike of the vein to be from the bottom of raise 658 to the north?

A. The general strike *is* developed in these workings, as nearly as I can ascertain it, is in a direction somewhat west of north. About north twenty or thirty west.

Q. Have you a piece of twine here? Attach that twine to the vein in the bottom of raise 658, and taking the local strike northerly, attach the other end of it to where it would come on the north dipping vein, taking that local strike?

A. I do not know where the point on the north dipping vein at the same elevation as this is located, so that I cannot attach the other end of the twine to it. It would be some distance off of this model. Somewhere presumably down in the Tonopah Extension workings.

Q. Have you been down the Tonopah Extension workings?

984 —. Only a very short distance.

Q. Can you farther up on the south dipping limb, select a place and give us the strike between that and the north dipping limb—local strike?

A. You do not need a piece of twine to give the local strike, I have already given that in a number of places.

Q. What is that?

A. I do not need a piece of twine to give the local strike. The local strike for instance at the end of the third level——

Q. Point out where? Can't you start in here (indicating)?

A. The local strike on the West End MacNamara vein, near the westerly extremity of the 500 level is about north thirty degrees east. North sixty degrees east, as shown by the direction of the drift.

Q. Well, if we take that strike there, of course, the strike would be on a horizontal plane?

A. Yes.

Q. And what would be the difference from the point here on the south dipping vein to the point on the north dipping vein?

A. I don't know.

Q. Well about how many hundred feet?

A. To follow around the vein I presume that it would be——

Q. No, on the course you gave?

A. On the course I gave—on the course of a local strike?

Q. Yes.

A. You would proceed on that local strike for a distance of fourteen or fifteen hundred feet and then swing around presumably.

Q. Well what did you give me the local strike to be on the 400 level?

A. About north sixty east.

Q. Do you know of any vein beneath the surface of the Eureka or Curtis claims, except the south dipping limb of this West End

985 MacNamara vein, the Fraction vein?

A. Yes.

Q. Have you another one?

A. Yes.

Q. Lying still deeper do you mean?

A. There is one lying still deeper, there is also one called the Wandering Boy vein, which lies under the Curtis vein for a portion of its distance.

Q. Take the Eureka claim—is there any except the Fraction vein and the south dipping limb of the West End-NacNamara claim?

A. Yes, the south vein, which is a branch of the main West End MacNamara vein.

Q. Well, apart from that any others?

A. I know of no others.

Q. Now, do I understand that the vein apart from the Fraction vein, that the vein underlying the Eureka, or the south dipping limb of the West End MacNamara vein, that portion of it which is found beneath the surface of the Eureka claim, lies in a vein, the top or apex of which crosses the side line of the West End claim, and is found along this westerly terminal edge?

A. That is true.

Q. When did you first reach that conclusion?

A. I first reached that conclusion sometime in August, as I recall it.

Q. Can you give the date any more specifically?

A. Towards the latter part of August. I cannot recall exactly.

Q. Did you communicate to counsel fro the Plaintiff company that conclusion?

A. Yes, sir.

Q. I suppose that as soon as you had arrived at the conclusion?

A. Shortly after having arrived at that conclusion I was in San Francisco, and discussed the matter with Judge Lindley.

Q. I did not hear?

986 A. Shortly after having arrived at that conclusion I was in San Francisco and discussed the matter with Judge Lindley.

Q. Do you remember how early that was or how late—can you fix the date of that, what month?

A. I did not discuss that matter personally; I wrote Judge Lindley a letter, he being east. I can find that letter and get the date, but I don't recall exactly.

Q. Was it in August?

A. Judge Lindley, do you recall when you were in Washington, at what time?

Mr. Lindley: I have been twice in Washington in the past three months.

A. Sometime in the latter part of August.

Mr. Dickson: That is all.

Mr. Lindley: In the early part of September, I think I was there.

Mr. Dickson: No further cross examination.

Mr. Lindley: I don't know. I might ask possibly the purpose of

the cross examination. What time was the answer filed in this case, Mr. Clerk, will you get me the answer in the case.

The Clerk: August 28th.

Mr. Lindley: *In* there any suggestions that that replication does not sufficiently cover this matter?

Mr. Dickson: No, I do not want to contend that.

Mr. Lindley: I will state very frankly that when this suit was brought, I did not take this situation into account,——

Mr. Dickson: There is nothing to conceal. I will state the purpose of it. In the replication I have in mind it is alleged in effect, that the vein underlying the Eureka and Curtis claims, has not its top or any part of its top or apex anywhere within the West End claim.

987 Mr. Lindley: I think that there is a little mistake in that phrasing. May I look at that replication. If there is any question about it, I will ask leave to amend.

Mr. Dickson: I do not think that there is any necessity to amend. To be perfectly frank I will call your attention to another point that throws some light upon it, and that is in your answer filed to the complaint of the West End Company.

Mr. Lindley: In the Fraction vein suit?

Mr. Dickson: Yes.

Mr. Lindley: That is not an issue here.

Mr. Dickson: No, but I intend to offer that answer in evidence. I thought maybe it would be fairer to you.

Mr. Lindley: To offer an answer or pleading in another case?

Mr. Dickson: Yes.

988 Mr. Lindley: Well, if there is anything wrong about these pleadings, we will have them straightened out before this case goes to the Judge.

Mr. Dickson: The only thing I claim about the pleadings is that they are insufficient with the theories——

Mr. Lindley: Well, you may say that the theory in August was a recent construction. I will confess myself that I was somewhat surprised at the demonstrated results.

The Court: Do you make that offer?

Mr. Dickson: No, until we come to rebuttal. I was just explaining——

Mr. Lindley: I am reading now from the replication filed in this case: (reading).

Mr. Dickson (reading): "Plaintiff denies that there is any portion of a vein or lode within the exterior boundaries and extended downward vertically of the said Eureke lode mining Claim, and the said Curtis Lod- Mining Claim, or either of them, which has its top or apex, or pany part thereof, within the exterior boundaries extended downward vertically of the said West End Mining claim."

Mr. Lindley: Which in its downward course lies within the exterior boundaries.

Mr. Dickson: I read that entire allegation.

Mr. Lindley: So far as Counsel is concerned in this case, the revelation came to me when I got a report from the engineer as to what the developments were at that end. Of course, I do not

conceive that it makes any difference to this case, and I am going to try and see if I can possibly get to this Court without involving that question. Because if they have an extralateral right in
989 any other direction, it does not concern us; and I do not want to mix up with the affairs of our neighbors. If this is an anticlinal vein, there is no extralateral rights. But if the question is insisted upon and is necessary to determine it, I am here for that purpose. I do not know when we get to the argument of this case, what position I shall take upon it. I do not want any question in the mind of the Court or Counsel on either side as to the status of these pleadings. If the issue is not fairly set up, I want the privilege of amending.

Mr. Dickson: I do not say that there is any amendment necessary in order for you to try the issues that are involved here. What I do contend is that in the pleadings, the replication in this case and the answer in the other case, which I will offer when we come to rebuttal, we find allegations that are not reconcilable with the present contention of the Plaintiff Company as to where the top or apex of this vein is.

(Further discussion by respective Counsel.)

Mr. Lindley: Are you through with Mr. Searls, Mr. Dickson?

Mr. Dickson: Yes.

Redirect examination.

Mr. Lindley:

(Q.) Now, Mr. Searls, marked on the map there are two sections, Y, X, and P M. What do those sections represent?

A. The section XY is—the section line X Y represented
990 on the map is the plane of a vertical cross section similar to the G G which I have introduced. It was surveyed with the expectation of platting upon it the exact reproduction of the occurrences of quartz along that section, as was done in the section G. G. The labor necessary to correctly portray all quartz existing in the vertical plane that such a section cuts is very considerable, and it was found impossible to do all of the work necessary to complete that section.

The section P M is a section line upon which a section was constructed from the McQuillan shaft, discovery shaft of the West End claim to the Porcupine shaft. It shows a dip upon the West End MacNamara vein of 12 degrees from its apex near the Porcupine shaft to the McQuillan shaft.

However, it was found that in portraying upon that section the position of the vein and of the Siebert fault, so much projection was necessary, there being considerable *are* where no workings were cut, that it was believed that it was not a satisfactory section to offer in evidence on account of the amount of projection.

Q. Now, Mr. Searls, since you were under direct examination, has there been a connection made with what we call 200 A, and the Defendant calls raise A, with the old drift marked on this model—the old raise marked 262?

A. There has been such a connection made in approximately the direction which I now hold my pencil. The connecting work is a diagonal raise which has followed throughout its extent the Siebert fault, exposed above in A raise and in the 252 raise.

991 So that is now absolutely demonstrated by the workings that the Siebert fault shown in the lower portion of the 252 raise below the 195 intermediate, and continuing up the 252 raise is the same identical gouge as shown in A raise.

And the working there further shows a number of quartz stringers above the vein which are cut off and terminated by the gouge.

Q. That would indicate what, with reference to the position of the Siebert fault and the south side of the anticline?

A. It shows clearly the divergence in strike of the Siebert fault and the north limb of the anticline. The Siebert fault, as disclosed in the A raise, and in the now connecting raise strikes about north 27 degrees west.

Mr. Lindley: I think that is all for the present. Call Professor Lawson. Oh, do you want to examine him about this?

Mr. Dickson: No.

Mr. Lindley: I would like to make this reservation with reference to this witness, that if before the case closes there is any other completed work being done by the other side, I may recall him simply for the purpose as to that work.

The Court: That may be done.

992 Testimony of ANDREW C. LAWSON, who, being called and duly sworn as a witness on behalf of the Plaintiff, testified as follows, to wit:

Direct examination.

Mr. Lindley:

(Q.) Professor Lawson, what is your profession?

A. I am professor of geology in the State University of California.

Q. How long have you been occupying the chair of geology in the University of California?

A. I have been there for 24 years.

Q. Prior to coming to the chair of geology of the University of California, what had been your previous experience or education in reference to your profession?

A. I was graduated a Bachelor of Arts of the University of Toronto in 1883, and Doctor of Philosophy at John Hopkins a few years later, and had in those years between the time of graduation and the time of coming to California engaged continuously on the geological survey of Canada as a geologist.

Q. Since coming to the chair of geology in the University of California, what has been your extent of experience in the field with reference to economic geology?

A. I have been every year since I have come to California, been engaged in the investigation of economic problems. I have

993 examined mines and investigated economic problems in geology throughout nearly all of the western states, and in various parts of Canada, and in Central America and Mexico; generally, of course, during the summer vacations of the University.

994 Q. Are you familiar with the region known as the Tonopah District, in which the mines in controversy in this case lie?

A. Yes.

Q. When did you first become acquainted with the conditions here?

A. In the year 1908.

Q. Under what circumstances?

A. At the time of the controversy between the MacNamara Mining Company and the West End mining company, I was engaged in investigating the condition of the two mines at that time in behalf of the MacNamara Mining Company.

Q. And to what extent did you investigate the conditions at that time?

A. To what extent?

Q. Yes.

A. Well, the investigation was not complete at the time when the controversy was closed by an agreement between the companies, but I had occasion to become familiar, fairly familiar with the underground workings of the two mines.

Q. Which are those two mines?

A. Those two mines are the MacNamara mine and the West End mine.

Q. Without undertaking to state at this juncture your deductions at this time, I will proceed to your later investigations. Have you been recently engaged in making an investigation in the region in controversy in this case, involving the Jim Butler the West End and the MacNamara workings?

A. I have.

Q. With reference to the result of your investigations, has there been any modification of your opinion expressed on your first examination?

A. No. As to the essential features of the West End MacNamara vein, the views that I have arrived at in my recent study confirm those that I had arrived at six years ago.

995 Q. Now, I will ask you to state Professor Lawson, in your own way the position that these veins occupy in the country rock, the relationship which the veins occupy towards those rocks, and what is the nature and character of the veins from your observations in the underground workings of these two mines, and such other mines as you may have visited in connection with these workings?

A. Speaking first as to the nature and character of the vein. It seems to me that it may be useful to point out something, as to the general conditions which control the process of vein formation, particularly with reference to the relationship that exists between

the position of a vein, to the contact of different formations in the ground, and also the relationship which exists between the vein and the stringers which are associated with it.

Now with regard to the first point. There is one antecedent condition to the formation of a vein and that is formation of a fracture in the earth crust, but antecedent to the fracture there is another condition, a condition of stress in the earth's crust. The fracture is formed in consequence of the stress, the stress accumulates locally in the earth's crust to such an extent that after it has been accommodated for a long time, by an elastic deformation of the earth's crust,—the stress accumulates to such an extent that it overcomes the strength of the materials in that region, and there is a rupture, and that rupture is a sudden thing, but nevertheless, by that sudden rupture it breaks through some point where the rupture begins, and travels very rapidly but notwithstanding it
996 travels from some point through the rocks of the region.

Now, if there be a diverse condition as to strength of rocks in the earth's crust in that region, then those diverse conditions will modify or rather will determine locus or position of the rupture when it is formed. For example, to illustrate very briefly, if we have——

Q. Mark that "Lawson-1" if you please.

A. If we have in any region of the earth's crust a line of demarcation or boundary between two formations we will say lying in that position, and another line of demarcation maybe lying over here, and we have the stress operating in that block of the earth's crust in such a way as to tend to move this portion of the earth's crust in this direction, out from the blac-board, approximately normal to it. Then, in response to that stress there will be for a long time an elastic deformation of the ground; it will move slightly by creeping, and finally will rupture; now when it ruptures the stress may be relieved by the rupture in a variety of directions; it is not necessary that that rupture be relieved by a particular line of break; the relief may be effected by a break in a variety of positions and directions, in that ground and if these two lines or planes exist in the ground, then the relief will quite probably, and in many cases it is relieved by following along these lines, as plane of weakness; that is to say, that we may regard the possible lines of rupture as lying within a certain angle, and that if within that angle it would effect a relief of stress, there be any other planes whatsoever, of particular weakness, then the rupture will adopt those planes as the plane of rupture.
997 Now, that means, of course, that when the rupture becomes mineralized that in so far as the fissure or rupture has adopted these planes of contact between the different formations, to that extent it becomes a contact vein. And in connection with the use of the term contact vein I would here call attention to a matter that has come into the controversy to some slight extent, as to the terminology. It is true that in geological literature we have many contact veins which are at the -ontact of sedimentary rocks or igneous rocks, and we have in consequence of the great heat which has been given up by those igneous rocks, a metamorphic zone, a zone which we call a con-

tact metamorphic zone, and inasmuch as there are many ore deposits in such situations, we speak of them as contact metamorphic zones, but when discussing those matters in the literature of geology we cut out the word metamorphic and refer to them briefly as contact deposits, but that does not embrace all of the contact deposits; it is only a shortening of the name of those which are associated with thise places where we have intrusive rocks coming up from below, as through sedimentary rock. There are other contact veins and deposits which are not so metamorphic, and such a one as I have here would be a contact deposit, so I want to clear up there use of the term.

Now, further, when this rupture takes place, so that we may have a rupture following these lines which I have indicated here—the rupture may follow this line here, and it may leave it in consequence of the influence of the other plane of contact here, and we may have a fissure having what I have indicated in green color on the
998 diagram No. 1; to the extent that it follows the red line on either side, it would be a contact deposit; to the extent that it departs from those contacts, it would be an ordinary fissure vein, and we have in this particular vein here, an illustration of precisely that state of affairs, namely, a fissure and rupture in the earth's crust, because of particular stress accumulating on the materials, and then following in particular the contact between different formations; now, as to the relationship between the vein that would occupy this fissure and the later process of mineralization, we have associated with the vein a rather marked zone of stringers,—but I want to advert to the relationship that exists between the stringers and the main zone. When this movement takes place it is progressive, it does not all occur at once. The process of mineralization is a long drawn out process; it is drawn out not only through years but doubtless through centuries and when the stress has been relieved by the first rupture we have a sudden movement forward of one piece of ground over the other to that extent. And that sudden jarring of the earth's crust is what creates an earthquake; earthquakes never create a rupture in the earth's crust, it is always the reverse, it is the rupture which creates the phenomena which we designate as an earthquake, the vibration of the ground; now, this process of the sudden movement at the time of the rupture is of the nature of an elastic rebound it starts that way and its tendency is to move this ground out away from the blackbord in this direction, normally to it, and there is a certain drag effect, an elastic drag, and that is within the lim-
999 its of the elasticity of the material, and when the rupture which creates the stress is relieved, this upper portion here would spring forward by reason of the relief from the control below and the lower part would swing back so that every fault is of the nature of an elastic rebound determined by the stress of the rock at the time when the release is effected. Now, when that stress has been relieved the actual amount of movement necessary to relieve it is usually quite small; when I say small I mean something less than forty or fifty feet; In so far as my experience goes in geology, so far as we know of the ruptures followed by earthquakes, to create the larger earthquakes, we know it is something less than fifty feet of

actual displacement, at the time of that movement; but we find many faults and fissures that have become mineralized where the displacement is many times fifty feet, and we are forced to conclude that in the process of the development of the fissure there has been a succession of movements, which is to say, that after the first stress has been relieved, it proceeds further to accumulate—it accumulates up to another stage when it is able to overcome the frictional resistance between these two sides of the ground, and there is another movement forward of the hanging wall upon the foot wall; and again that movement is an elastic rebound, the foot passing the hanging wall along a certain smaller limit, and we have therefore to recognize that the formation of a fissure which involves a large displacement must be a succession of small displacements extending through long periods of time.

1000 Further this friction of one wall on the other creates a very severe shattering of the walls in the region immediately adjacent to the zone of friction or to the surface of the friction. And these elastic rocks are broken, and they are shattered so that we have a series of cracks running through this zone, generally more or less transverse to the direction of the main fissure, but maybe sub-parallel to the fissure, and inasmuch as the foot wall is affected by the same process, it is also characterized by the development of similar cracks and similar fissures traversing it in a similar way, and those may be transverse to it or make any angle with it, or be sub-parallel to it.

So that in the development of any fissure, if the rocks, as to their general condition are the same above and below, or approximately the same, we have developed in both sides of the fissure a zone extending out to a variable extent from the main fissure, characterized by the presence of numerous small cracks.

So that this zone of cracks, and small fissures, when the mineralization process set in, and when the vein becomes filled by the deposit from the solutions that permeate that avenue of percolation, not only is the vein filled with mineral matter, quartz, ore, and so on, but the same materials filter into those cracks and fill them. Not only do they do that, but they have access to a very large surface indeed of the rock, and in that way are able to replace a very considerable zone of the rock itself by silica, and give rise to very large and important bodies of quartz, which never filled the spaces
1001 in the sense of cracks, but simply replaced particle by particle the solid quartz.

So that there is a very definite and genetic connection between these irregular stringers that accompany the main fissure.

The fact that that is so is not a mere inference, not a mere deduction from the mechanics of the situation was well shown at the time of the fault and fissure which was formed at the time of the California earthquake in 1906. I had particular occasion to study that earthquake in as great detail as was possible. I devoted a year or more to its detail study, and it was found that along that enormous fissure that extended down through the coast ranges along the coast of California for a distance of betw-en 270 and 300 miles, it was found that numerous places not only did we have a distinct rupture

through the earth's crust so that roads were faulted and fences and all physicial lines upon the surface of the earth were faulted and displaced as much as 21 feet *feet* as a maximum, and in very many instances as much as 15 feet; that not only was there displacement in *of* that particular rupture, but that on either side of that fissure there were numerous cracks extending out in all directions into the surrounding country.

So that we have not only, I say inferentially knowledge that this is the fact, but we have the observational knowledge that such things do happen. That when the fissure is formed, when the movement occurs, there is a development of auxil*l*iary cracks adjacent to and genetically connected with the main rupture through the
1002 earth's crust.

Now, I may pass, with those generalities, to the particular case before us. We have in this ground two prominent features. We have a vein which is known as the West End MacNamara vein, which extends broadly with a low dipping mineralized fissure, with accompanying zone of stringers above and below, and having a rolling character, so that one of these rolls is pronounced and has the form and figuration of what has been designated throughout this case as an anticlinal roll.

Now, that is one feature of that particular vein, and that vein was formed in the earth's crust by the mineralization of a contact fissure. I say a contact fissure in the sense in which I have alluded to it in this diagram, a fissure which was partly determined or formed along a contact plane and partly outside of the control of such contacts.

That fissure and the mineralization of the fissure to form the West End MacNamara vein was completed long before the appearance in this region of what is known as the Midway andesite. And the measure of that time between the formation of this vein and the appearance of the Midway andesite is in terms of erosion. Usually we measure the length of the geological time in terms of sedimentation. Geologists measure strata and estimate what has been the geological time by what they can see in the strata, by the deposits that have occurred in the region they are studying during the time they are thinking about. But it is also a well known princip*a*l in geology that we can also take some account of very large inter-
1003 vals of geological time by noting what has happened, not in the way of a deposition, but in the way of erosion; the extent and the amount of degradation of the earth's surface by the attack of rain and frost and the atmosphere generally, running water, all those things tend continually to reduce the inequalities of the earth's surface, to reduce them to the lower levels, carry away the waste, and so lower the surface. And if we note the extent of thos erosion, then we form some idea, at least, of the interval of time which was necessary for that erosion to be completed to the extent that we can observe.

Now, that erosion so far as that in this region about Tonopah is concerned, has proceeded so far that fissures—the veins that existed in the region were exposed at the surface as outcrops, and when the Midway andesite was poured out over this surface as a lava flow, it

buried the surface, and of course it buried also the outcrops of many valuable veins. That is, of course, one of the troubles in this camp, that the mines had to be sought for by blind exploration, very largely blind exploration beneath the overlying mantle of that particular lava we call Midway andesite.

After the accumulation of the Midway andesite, this region was subjected to a still further process of erosion. Another time interval was introduced, and during that time interval a large part of the Midway andesite was removed, and part of the old surface which was buried was resurrected by the removal of the cover, and that again was a long period of time. And that period of erosion was followed by a period of volcanic activity during which some volcano in
1004 this region erupted numerous fragments, thrown out by explosive violence into the air, and these fragments, fell through the air upon that surface and covered it, but that process of covering the ground with the materials thrown out by explosive violence from this volcano was not necessarily a thing that happened in a day. It was probably something that went on very much the way that Lassen Butte is acting at the present time, fitful operations and no large body of fragmental matters thrown out in any one day, or in one year. It may have taken a hundred years to have made any notable contribution to this large and thick volume of what we call the Fraction dacite breccia, for that is the material I am talking about.

This fragmental volcanic material, is not something that came out *out* of a volcano as a flow and spread out over the ground the way that lava does, but something that was thrown out into the air and fell there through a considerable radius of the country, a radius probably of many miles. And that particular material, I say, may well have accumulated slowly through years, but it buried the old surface that was evolved by the degradation and erosion, it buried the whole surface that was made at that time.

And where the Midway andesite had been removed here there were veins cropping out on that surface, and they were buried by the accumulating materials thrown up by the volcano. Now, these outcropping veins were sometimes very bold outcrops, they were outcrops that stuck up above the hillside several feet. They were features that would delight the eye of the prospector. He
1005 could see them from afar as combs running across the hillsides, and yet finally they were buried and were lost to sight and have been ever since until we have unearthed them by mining operations that reveal them precisely as they were at that time in the ground.

Now, I say a long period of geological time *that* had elapsed since the first formation of this vein. But the second notable feature of the region that I had in mind when I said there were two notable features in the region that I wanted to allude to, the second notable feature is the Siebert fault.

And the Siebert fault never existed in this region until after the Fraction dacite breccia had been spread out to a very considerable thickness over the entire region. So the interval that I have in-

dicated as having elapsed between the formation of the West End MacNamara vein, that interval is some measure of the time that has elapsed between the formation of the vein and the formation of the Siebert fault. The evidence of that point is perfectly clear from the geological point of view. Geologically we can see that this Siebert fault slices through the country in such a way as to cut the Midway andesite, and to cut the Fraction dacite breccia, and therefore it is absolutely certain, as anything can be, in the science of geology, that it occurred after those formations had been in existence, and the vein, West End MacNamara vein was in existence long before those formations appeared in this region.

So that seems to me to be a controlling consideration in coming to any decision as to the relationships here, and if I might
1006 detail some of the evidence of that fact, I perhaps need not go into the evidence of the existence of the West End MacNamara vein anterior to the coming out of the Midway andesite. I suppose everybody concedes that. But when we come to the consideration of the other question, it may be perhaps desireable to point out the evidence which supports that general view.

I will first point out some of the evidence as to the distinctness of these two features in the ground. You take any of the exposures in the ground where we can see the vein, the West End MacNamara vein, and compare it nearby with the Siebert fault, we are struck by first the contrast that exists between the gouge of the Siebert fault and the ancient, undurated and largely silicified gouge of the West End MacNamara vein. And to illustrate that contrast and diversity between the two things, I have two speciments that I would like to show the Court.

Mr. Lindley:

(Q.) Mark those Lawson 2 and 3.

A. They are difficult to mark with the pencil, they are so rough.

Q. We ought to have some pasters to stick on.

A. I have marked this one L. 2, and the other one L. 3. They can be more permanently marked later, I suppose.

The Court: They will be all marked again.

The Witness: Now, the piece of rock that I hold in my hand, marked L. 2, occurs very commonly indeed in the West End MacNamara vein, in many places at the top of the vein, in other places in the middle of the vein, and in still other places at the
1007 bottom of the vein. It represents in the ancient fissure, the gouge that was formed by the movement of one wall on the other, rubbing the material into fragments, and some of them into powder so that they became a pasty mass as a gouge, as it is called by the miners.

Now, this pasty mass is shown here, but it is indurated by the long process of sili-fication. It has become so hard that it is difficult to break with a hammer, and it is brittle. It is not a gouge in the ordinary sense at all. It might not be recognized even by the miners as a gouge, but, nevertheless, it is, because it has characteristic evidences that one can see many places in the mine of

that gouge. Now, there is the gouge of this vein. Here is a piece of the gouge from the Siebert fault, a soft material; you can dig your fingernails in it. It is generally moist. It is a tough gouge, plastic, tenacious and slabs off in a dangerous way by reason of its weakness, lack of strength of material.

1008 It is totally different from this particular gouge of the vein, and we have those two things, therefore, as an element in the distinction between the two things.

Now, by studying this gouge in its distribution, let us say the gouge marked L-2, the ancient silicified gouge of the vein, we have a criterion for determining whether or not this vein is continuous over this roll, or anticlinal feature of the vein. Take for example the upper stopes here of the MacNamara ground, we can see perfectly plainly along in the bottom of the stopes, and along the various pillars, that hold up the roof of a stope, we can see perfectly plainly this black streak so distinguished from the whitish quartz of the vein having a limited thickness, from the fraction of an inch to several inches, following the contact of the vein continuously around the top of the stope and on the north side, and on the south side. It is a feature which goes over the roll and shows clearly that there is continuity and identity of that particular vein over this place where the dip changes, and which we call the anticlinal axis.

That is true not only in the upper stopes of the MacNamara, and it is true in other places in the mine.

Now, another consideration which shows a distinctness of the two veins, their separateness, which I have shown are so separate in time, I want to show also their separateness in another point, for another reason, for regarding them as distinct from one another, and for that purpose I will call the attention of the Court to the fact that there was another episode in the history of this vein to which I have not alluded.

1009 That at some time anterior to the formation of the Siebert Fault the country was disturbed to a very moderate extent. They were minor deformations, and minor breaks, so that the vein is traversed by transverse fissures, and faults. We can see the vein dropped one portion against another a few feet in numerous places. Now, there are places where this Siebert Fault, as has been amply pointed out in the testimony, where the Siebert Fault comes very close to this vein, becomes tangent to it, as has been said, and we can see the relation of that Siebert fault with reference to the vein, we can see the relationship to these earlier small faults that have cut the vein. The Siebert Fault cuts these small ancient faults that have cut the vein and slices through them without any interruption whatever, and to make that clear I would like to sketch a diagram, or two or three diagrams to illustrate the fact that I am asserting. I may be permitted to use my notebook, as I desire to reproduce a sketch which I made in the ground, I suppose——

Q. Perfectly proper.

A. The sketch which I am placing on the board is a sketch——

Q. Mark that Lawson 4, please.

A. Taken on the 400 level. It is taken on the 400 level near the

McQuillan shaft. A little to the east of the McQuillan shaft, where two drifts come together. I see no number on the drift, but it is very close indeed to the McQuillan shaft.

Now, in this particular place, one may see what I shall endeavor to sketch. The red line represents a trace in the face of broken rock of the Siebert Fault. Now, below the Siebert Fault is a vein, and about here is one of these minor earlier faults, that have cut
1010 the vein, and at the right hand side of that fault, as shown in the blue line here, the vein is broken up and is a breccia. It is made up of broken pieces that are shattered with open texture, angular fragments of the -uartz, extending almost to the bottom of the drift. And beyond that zone is solid quartz the shattering being due to the particular fault in blue here, and which I may mark perhaps as "Earlier Fault," that fault in passing through the vein has had the effect of smashing up the quartz. This is all broken up, fragmental quartz and as you pass off eighteen inches or two feet from the fault this zone or broken up material ends, and we pass into the solid vein, so that the solid vein may be represented off here in this particular marking of blue, and I will write on that "solid vein" and I will write on the portion that is broken, I will write "breccia."

Now that is the appearance of the right hand side of the earlier fault, as we look at it. On the other side of the fault we have another appearance. I will say first that above the Siebert fault here we have the Mizpah trachyte which I will indicated by the letters "M. T." M. T. stands for Mizpah trac-yte, as the hanging wall of the Siebert fault, along here for a distance of five feet we can see the top of the vein and it has this configuration, that is the top of the vein (indicating). And I will write on there "top of vein."

I will indicate first that this top of the vein has a thickness varying from two to five inches, somewhat variable, and that the top of the vein is the ancient gouge, which I have referred to, and in speaking of the sample Exhibit L-2, it is the same type of ancient
1011 silicified gouge that forms the top of the vein in that particular streak. And this has a streaky appearance. Shows the characteristic streaky appearance of gouges, and it has little fragments of rock and quartz in it which are not thoroughly pulverized as the most of it was, at the time of the formation of this West End MacNamara vein.

Now below this ancient gouge we have the solid vein again. Of course that is solid too, but it is distinguished usually from the solid quartz below by the black color.

Then from here, as we go down to the bottom of the floor of the drift, about five feet, six feet, there is another jog in the vein, there is a break here, a short break by a little fault which goes on down here. That is the wrong pencil. Goes on here, the same streaky appearance that we have here. This continuation of that ancient gouge dropped down. And over here it is cut off by another fault and we do not see any more of that gouge off here but you see a piece of it lying in the ground tilted up at an angle of that kind (indicating). There is another piece of the gouge. And in between here we have the vein following the quartz, ordinary whitish quartz here.

I will write on the part of the vein referred to as gouge, I will write "silicified gouge."

Over on these two detached portions separated by faulting, I will put the letters "S. G." to indicate that they are the same silicified gouge.

Now, in this triangular area here (indicating) we have the Mizpah trachyte more or less broken down, more or less crushed, but nevertheless clearly the Mizpah trachyte as it originally laid upon the top of the West End MacNamara vein before the Siebert fault
1012 came along and separated this portion of the Mizpah trachyte from the portion of the Mizpah trachyte above the fault.

Now, inasmuch as the movement of the hanging wall upon the foot wall of the Siebert fault was down to the left, indicated by the arrow, insofar as this component motion is concerned in this plane there was a drag which was manifested at this place by the fact that this broken, brecciated quartz was dragged out here in a very definite way and one can see the drag out here (indicating). Broken pieces dragged out so that the fault plane is no longer apparent above this point here at the bottom of the drag, and that is material dragged by reason of the movement of the hanging wall over the foot wall.

Now, on the right side of this earlier fault which jogged the vein to quite an extent, there is no trace whatsoever of this ancient silicified gouge. It is entirely absent, there is no trace of it. The vein has been sliced through by the Siebert fault so as to remove the whole of the silicified gouge and some portion of the quartz below it. So that we have there the most positive and absolute proof that you could possibly have of the fact that the Siebert fault is a later thing than the West End MacNamara vein, and a very distinct thing indeed from it; a thing that is antecedent entirely to the existence of the vein.

Q. You said antecedent?

A. Antecedent to the existence——

Q. Subsequent?

A. Yes, subsequent, of course. Correct that, please. It is
1013 the wrong word. Subsequent.

Now, there are one or two other places where one can see that this is not a solitary thing. It is a characteristic thing. It is a thing that grows on one as he gets familiar with the mine. Take the case of the 473 winze. As 473 winze is shown on the model here, it has been followed down for some distance over the crest of the anticlinal curve of the vein and down on its northerly dip.

Q. One moment, professor. Have you got your number right there?

A. The number of what?

Q. That winze?

A. 573.

Q. You said 475.

A. Yes, 573. I stand corrected. On the 573 winze. In going down this winze, which has a very gentle dip going northerly, after it passes over the anticlinal curve, as we pass down that winze we can see in the walls of the winze that the vein which is followed by the

winze has been faulted to a slight extent. A fault of from 4 to 5 feet, and the appearance on the side of the winze is something like this. I will draw here against a red line.

Q. Mark that Lawson 5, please.

A. I beg your pardon?

Q. Lawson 5.

A. Lawson 5. I will draw a red line on the exhibit 5, which represents the trace of the Siebert fault on the side of the winze.

Remember, it is a flat winze, it is not a vertical winze, it is a
1014 flat winze so it is very nearly a drift. And on the side of the flat winze or drift we can see the trace of the fault.

We have below that fault an earlier fault exposed which extends in this relation to the Siebert fault, that blue line represent- one of these earlier small faults that dislocated the vein to a slight extent. And here we have the top of the vein (indicating).

And down here we have the top of the vein, and the distance of the displacement of the top of the vein from the left side of the blue line or earlier fault, to the right side is about 4 or 5 feet.

I will have to change that. I made an error in copying the note.

1015 Beginning over again on "Lawson No. 5," the red line will as before represent the course of the Siebert fault and here is the blue line again representing the earlier fault that jogs the vein; I will mark it "earlier fault," and will mark the red line "Siebert fault," and hereon, on this side, is the top of the vein and above the top of the vein is the trachyte which I will mark "M T" Mizpah trachyte, and on this side is the top of the vein dropped down four or five feet of down pull on the earlier fault and the vein extends down to the—well, to the bottom here, and the jog of the little fault is very plain.

The contract between the Mizpah trachyte in the down thrown side of the fault, or on the left hand side of the fault, marked M T, and the quartz immediately opposite it, is pretty clear. Now the illustration shows clearly that this fault was here, and that it was sliced off by the Siebert fault and that, therefore, the West End MacNamara vein, marked here "vein," was in existence and had been faulted before the Siebert fault appeared in this country to slice off these little displacements which had earlier affected it. A similar phenomenon may be seen over in the portion of the MacNamara ground,—it is not numbered here—but in the drift or—on a drift on the vein of the three hundred MacNamara to the north, at its extremity, one may see there again the gouge of the vein, and one may see a vertical small displacement and see the fault that caused the displacement, and one may see the Siebert Fault slicing right through the fault and again the evidence is perfectly plain that we have a vein in existence anterior not only to the Siebert Fault but also to the deformation that preceeded the Siebert Fault;
1016 so that conditions of that kind it seems to me are positive evidence of the discreet separate character of the two things, the Siebert Fault and the vein, not only physically as indicated by the gouges, but as a matter of time; there is a large interval of time between the coming into being of the two fissures.

At this time a recess was declared until three forty five P. M. December 19th. 1914.

After Recess.

The Court: The Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

ANDREW C. LAWSON on the stand for further direct examination.

A. (con.). Before recess I was about to speak of the phenomenon observable in A raises as bearing on the relationship of the Siebert Fault to the West End MacNamara vein. In these raises, or rather at the foot of these raises, along the crest of the anticlinal roll, which is followed by the upper of the two stopes, that are here situated above the 400 level, we have a point at tangency between the Siebert Fault and the curve of the West End MacNamara vein, and the Siebert fault has been revealed and exposed in a number of raises known as the 2-A, 4-A, 5-A, 6-A and 7-A raises, proceeding upward on the course of the Siebert from the stope near the crest of the roll. Now,
1017 I have examined that particular situation with very great care, and have found the usual evidences of the distinct character of the fault and the vein. In these raises we find exemplifications of that particular development of quartz which belongs to the stringer zone above the main body of quartz of the vein, and the fault slices through these stringers, some of them almost transversely some of them obliquely and a few of them at a low angle, but in every case is a slice through the country including the stringers; there is, moreover, no mineralization on the fault itself, there is no appearance of quartz, development, parallel and coincident with the course of the fault's gouge; we have at the head of the A-raise,—the 5-A raise. we have a larger mass of quartz at a distance of about fifteen feet down the raise from its face—we have a larger body of quartz, but that is quite clearly, I would say larger usually—quite clearly sliced off by the fault. Not only is the distinctness of the fault from the stringers as well as from the vein shown by these slicings through, and by the usual phenomena of the slickened sides, and the abrasions and termination of gouge upon the stringers themselves, but as we go down below the bottom of those raises, on raises that have been driven on the northerly limb of the fold, on the northern side of the anticlinal axis, we find that the Siebert Fault has actually sliced off a portion of the vein. We can see clearly that in the stope itself, and in the raises 496 and 494, that the Siebert Fault is a little more than tangent-al, that it has sliced off a little bit of the top of the vein, and that phenomenon is per-
1018 fectly apparent and to illustrate it I would like to make another sketch.

Mr. Lindley: Mark that "Lawson-6" Professor.

A. (Indicating.) I will use a red line for the trace of the Siebert Fault, on the plane of this section, this is through the 5-A Raise, and the configuration of the raise is something as I shall attempt to sketch it—in black lines.

Now about here there are some timbers standing, and in here there is a well defined line in the quartz, about here, hard wall in the quartz itself, so I had better use another color for that; and above that there is a body of quartz two feet thick which extends up into the raise, and the quartz extends into an overhang here, resting against this pillar; there is a body of quartz something in that fashion, and I shall color the quartz with the yellow where it is still unstoped. Now, over here we have about two feet of quartz in this position; on the head of the raise that goes down, I think that it is the 496 raise, we have about two feet of quartz there, and that two feet of quartz can be followed down the raise about eighteen feet, and at a distance of eighteen feet from the stope, it is sliced off. It is a little in here more, and then as you go down, further down on the side where the raise is steeper, down in this direction, the quartz appears again in a position like this. I am not very skillful at sketching but this distance here should be something like twenty-five feet, so that this quartz here on the side of the drift in place, this quartz here in place, and of course there was quartz above the dotted line, the dotted yellow line which I indicate, represents the bottom of the quartz in the stope, and as it was stoped out down on the south
1019 side, so that we have clearly displayed the fact that the Siebert Fault which is followed up the 5-A raise at an angle of about twenty-five or twenty-six degrees, by reason of the fact that it is something oblique to the dip and therefore flatter than the actual dip, we have an exemplification of the fact that this Siebert Fault not only transverses and slices through the various stringers, as seen on the walls of this 5-A raise, actually slices off a portion of the crest of the main vein, and that quartz nevertheless is perfectly continuous over into the stope,—taking the stope for evidence of its former existence we have continuity of quartz over the roll and for a distance of eighteen feet down on the northerly slope of the anticline, or the northerly dip, and then at an interval of twenty-five feet, when the raise becomes steeper, we have—that red line represents the way in which the Siebert Fault slices off a portion of the curve of this anticlinal roll, but leaves the vein intact below that, and traceable continuously down to a point eighteen feet down on the northerly dip, and a little below that we have the quartz appearing strong on the steeper portion of the raise 496, and being continuous from there on down to the 400 level.

Now, in the 7-A raise we have a similar phenomenon where the slicing is not quite so complete, and I will have to show that. The inference that I draw from the phenomenon I may say is again clearly that the Siebert Fault is a later thing than the West End-MacNamara vein, that it not only slices through the accompanying stringer zone but cuts through a portion of the vein itself.

Now, the 7-A raise which is further up this stope, near its
1020 top we have a similar appearance, or at least analogous appearance. I will try and draw it a little more clearly.

Q. Lawson 7.

A. Lawson 7. (Indicating.)

Of course at best it is only a sketch, and we have here a raise go-

ing up to the 7-A raise and a regular roof, and over here there is a little drift that goes in at the extreme top of the stope, and down here it goes on into the 494 raise; in the 494 raise there are two upraises situated in this fashion, and in general relation to one another, it would be so—(indicating). Now, down here, of course, we have the top of the stopes on the south limb of the anticlinal fold on the left hand here, and we have a curve of this kind on the floor of the stope, and then when we reach this point we begin to descend on the 494 raise; now the quartz can be seen, I can indicate—the quartz can be seen as the yellow color represents and one can see it as it passes over on a distinct curve immediately in front of this little short drift, that is at the head of the stope; one can see the quartz distinctly passing into the raise with a flatter curve than the raise itself and be chiseled off like that, and it looks as though the quartz disappeared here and there is evidence,—I will have to bring this a little lower down here in order to make the diagram correct,—in here we find quartz and there may — a few, a very few indeed between the chiseled edge of the quartz here where it is shaved off by the fault, which may be indicated in the red color. The fault goes on through this portion of the roof here, through here, and goes down in this fashion, and

1021 I should have my yellow color of course it I will have to change that. The fact that I desire to make is that the evidence is clear that this fault, the Siebert Fault indicated by the red line again, in another section, approximately parallel with the 5-A section,—does exactly the same thing, namely, slices off a portion, and but a very small portion indeed of the West End-MacNamara vein, on its northerly dip, and that after you pass,—it is not clear that it is all gone there; it may go into the roof there and may go in here, but there is an interval here of a very few feet, not more than ten feet, where you cannot see the quartz,—you leave the quartz here and you have to pass through an interval of ten feet or so before you see the quartz, and then you see it again in this raise, and from here down you get plenty of quartz continuing on down to the fourth level.

Not only that, but somewhere in here, in the bottom of this raise, there is a cross cut runs in here, and this cross cut going in here is all in quartz, and goes into the lower stope. This is the upper stope and there is another stope in here, and this quartz that is down in this portion of the raise is continuous in here, and connects immediately and directly without any break whatsoever with the main body of the quartz in this first intermediate stope above the four level.

Q. Can you cut down the line of that lower stope there?

A. I can do that. It is entirely from memory of course. There is the general configuration of the stope below, it is rather flat and that is all stoped ground, and this is all stoped ground, all part of the same vein,—is valuable rock and in between is a mass of tall stringers running through the trachyte, and that shows clearly that there

1022 is a perfect continuity with the vein on its northern dip, with the vein certainly in the lower stopes, and bar-ing a slicing off of small portions, with the vein in the upper stopes, or upper intermediate curving over on the southerly dip; now that is perfectly

clear, nothing obscure about it, and we have an exemplification here also perfectly clear, that the Siebert fault is a later thing that slices through, and in other places scarcely reaches the vein; and the region over the vein in proximity to the fault is limited, a limited area; it is not the whole covered by this model, it is only a portion extending from the vicinity of the McQuillan shaft over to the region that may be said to — short of the cross cut, extending between the MacNamara shaft and the West End shaft, particularly of course, in the lower lefel. Now, in this region not only do we have these clear evidences of the fact of the Siebert fault slicing through the stringer zone, and through the vein itself to the slight extent that I indicate, and thus showing its later age, but when we follow or try to follow the relationship of the Siebert fault and the vein, we fund that the two separate and depart from one another. We find that the vein takes one course and the fault another; for example, down here at the nose or toe of the anticlinal fold on the 400 level, as has been indicated already in the testimony the West End MacNamara vein can be followed on a contour around the nose of the anticlinal fold; there is no break practically on that tracing, so that not only can we follow the vein on its dip over the fold, but we can follow it around on a contour and show its perfect continuity, in the sense that there is no break in the level any more than there is over on the
1023 dip, and in taking that around the nose where it is intersected by the plane of the 400 level, we have to drop down ten or twelve feet to this intermediate level below here, because the openings on the 400 level itself do not reveal the complete continuity but there are intermediates immediately below the level which show that the quartz is completely continuous around the nose of this anticline; so, taking the exposures in the 400 level proper, and taking the exposures in the intermediate ten or twelve feet below we have a continuity of quartz without any break around the contour of that level, or a contour ten or twelve feet below that. Now in this very region where we have that curvature of the vein around the toe or nose of the anticline, we have an excellent exposure of the Siebert Fault, maintaining its regular course, going on in this direction towards the bottom of the 488 raise; that exposure of the fault is a continuous exposure, and it is an exposure of the fault where it goes out into the hanging wall of the vein, the vein being below it and not being in direct continuity with it as it is up here in these stopes that I have been discussing on Exhibit-7.

1024 Now, that departure of the vein on its strike—that departure of the fault on its strike and dip from the vein is, of course, another clear indication of the separateness of that feature from the vein; an indication of the independence of the fault from the vein, an indication that they are not genetically connected, an indication that the relationship is *as* accidnetal one in a large measure, although there may be a causal connection in this sense, that the existence of the vein in that region, determined, as discussed in my preliminary remarks, determined the position of the vein in that region.

Q. The vein or fault?

A. Determined the position of the fault in that region. Although there may be a causal relation, it is not in any sense a genetic connection in the sense that it had anything to do with the mineralization, or in any *any* way controlled the mineralization of the West End MacNamara vein.

Of course, that continuity which can be traced over the roll of the vein, over the anticlinal roll on the dip of the two limbs, and around on the contour in approximately the 400 level can also be shown to be continuous in some of these upper stopes. I say it is possible not only to follow the vein from the dip here and show it is continuous in the direction of the dip, but it — possible to follow the vein around the bottom of the stope in approximation of a contour and show that it is continuous, one identical thing, without break, just as we can down here on the 4 level.

Q. Will you take up raise 200 A, or raise A?

1025 A. In raise A we have another illustration of the departure of the Siebert fault from the vein.

Q. Have you seen that since that connection was made, Professor Lawson?

A. Yes, I saw it last night. And not only do we have an exposure of the Siebert fault as it leaves the vein in these A raises, but it continues through the A raise and through the connection between the A raise and this raise up to the 136 intermediate level.

Q. Is that raise 262? Is that marked 262?

A. The raise—I cannot see the number. Yes, to raise 262. There is a connection between the A raise and raise 262, and the Siebert fault which is so well exposed in the raise A is absolutely continuous through into the raise 262. And we have again an excellent indication and exemplification of the departure of the vein—of the departure of the Siebert fault from the vein, not only on its dip, but down at the bottom of the stope here we have a splendid exemplification of the departu-es of the fault from the vein on its strike.

In this lower portion of the stope there is a small drift, and in that drift one can see both the vein and the fault, and one can see the divergence of the two. It is possible to stand or sit right in the opening of the ground there and look at the two things without twisting the neck, and see the two things diverging, and the angle of divergence on the strike there is something in the neighborhood of 25 degrees. And it is noteworthy that if one gets beyond that point of divergence in this direction (indicating) there is nowhere in

1026 these stopes A further indications of the phenomena that usually characterizes the Siebert fault. Down in this region I have been previously speaking of, down in those intermediates and here we have the Siebert fault and the hanging wall of the vein close together, and in the same openings we can see the two things.

But after they depart or diverge from one another in this particular region here that is over in those workings, one sees no more of that characteristic gouge of the Siebert fault. You only have the hard, dry, silicified gouge characteristic of the hanging wall of the vein. And the reason for it is that the Siebert fault is off here somewhere

in the hanging, which is not revealed in the opening, it has departed from the course of the vein both on the strike and dip.

Another indication, of course, of the separate and distinct character of the two things.

Q. When you laid your hand over there and made this discussion with regard to the position of this hard gouge, and not seeing any appearance of the gouge on the fault planes, you had reference to the stoped area in the West End MacNamara?

A. Yes. I was referring to the stoped area——

Mr. Dickson:

(Q.) In the north dipping limb?

A. In the north dipping limb of the anticlinal fold of the vein in the MacNamara ground, toward its western part. In stopes marked 7 and 8 and 9 A.

There are many details about this. I have simply attempted to offer gener-l observations that I have made, and have not attempted to go into detail in my statement.

1027 I may go on to remark that this vein affords an illustration of those outcrops of the veins upon the old buried surface which has been revealed by the mining operations. Of course, one of the finest illustrations of that is perhaps on the 300 level west. And on this 300 level, as we pass along, we come to the end of the vein on that level and on that stoping. We not only find the end of the vein on the level, but we find the end of the vein or the top of the vein or the terminus of the vein up in the stopes. And we go up those stopes here, above the level and where the stoping stopped, it stopped because the vein ended on its upward course. That is the end of the vein going upward in the stopes, and it is covered by this material that we call the Fraction dacite breccia which is, geologically, a volcanic fragmental rock that was thrown out by explosion and covered the old surface, and down here on the level one can see the amount of relief that existed in that surface, because it is clear from the exposure on the side of the drift that the vein stood up to a heighth of several feet above the level, and that to a certain extent, just as is true in many exposures of veins on hillsides, on account of the dip of the vein, the vein was overhanging somewhat, and you can see the overhang of the vein as it appeared at the old surface on this 300 level at this place at the end of the No. 4 stope.

Now, of course, going up the 262 raise we come to a position directly above the top of the stopes, and right im-ediately above these stopes we pass through a continuous stretch of this Fraction dacite breccia, and that Fraction dacite breccia on the 136 level, or

1028 intermediate is continuous over the top of the 262 raise right to the Porcupine shaft, and the Porcupine shaft is in the Fraction dacite breccia from top to bottom. And we can see in this 172 level at the bottom of the shaft, we can see the fraction dacite breccia.

So that it is perfectly certain that here we have a terminal edge of the vein on its upward course, abutting upon the bottom of this fraction dacite breccia. The same thing may be seen farther out here on

the Ohio ground, but that Ohio working is apparently not on the map and I can simply state the fact that they are there just as clearly as elsewhere. We can see the abuttment of the vein on its upward course against the bottom of the fraction dacite breccia.

The same phenomena may be seen plainly on the extremity, the Western extremity of the West End Five level. There we have the end of the vein covered—the top of the vein covered by the fraction dacite breccia.

The same thing is true down on the six hundred, on the extremity of the six hundred level. We see the cut-off of the vein and the abuttment of its old outcrop into and upon the fraction dacite breccia.

So that there is not the slightest doubt of the ending of the vein, and that that ending was an exposure at a surface under the weather, under the atmosphere is, in my mind, unquestionable. You have the phenomena of oxidation which has been alluded to, and you have the phenomena of leaching. I have two samples here that I might refer to briefly as illustrating that fact. Here is a piece of
1029 rock taken from the apex on the three hundred West End level?

Q. Mark that.

A. It shows the characteristic phenomena of gossan.

Q. Mark that Lawson 8.

Mr. Dickson: It is pretty hard to mark it.

The Court: Well, indicate it. We will have a paster put on it later.

The Witness: No. 8. That specimen shows the phenomena of dissolution, the removal of material by the action of water, such as the appearance—the same appearance exactly as one sees on surface of exposures of quartz where the quartz is not perhaps principally homogeneous, where there are other materials with it. The process of oxidation of other minerals disseminated through the quartz now appear in the form of limonite. Various characters of the gosson.

In another specimen from the same neighborhood, while we do not see any staining in this specimen, which I may mark "L 9," it shows another phenomena, that it is characteristic of the exposures or veins at outcrops, namely the leaching of certain materials out of it, so that it has a honeycombed appearance.

I had not seen this honeycombed appearance anywhere in the mine, except in the vicinity of the outcrop. It may extend down from the outcrop some considerable distance, but it is a phenomenon that I regard as indicative of a former exposure of the vein to the weather, and the quartz is seen not to be homogeneous; there is little soft particles in it, and these apparently are dissolved out or washed out and leave these caverns or cavities throughout the rock.
1030 That honeycombed appearance is an extremely common appearance in the gossan, and it is not necessary that we should have the red stain commonly present to demonstrate that fact. There are many characteristics besides the red stain, such as this honeycombed appearance, *tho* indicate the same thing.

Judge, I do not know whether I have answered your question or not, but I have done the best I could.

Q. I think you have come pretty near it. Have you any suggestions to make with regard to the shape or form of this fault, and its possible origin and direction.

A. The Siebert fault?

Q. Yes sir.

A. The Siebert fault is rather a flat fault. Its dip on the A raises here above the second intermediate on the 4, the dip is in the neighborhood of 30 degrees, probably slightly less than 30 degrees. Of course, it is a little more than the angle of the raises themselves. And that continues down to the 400, and the exposure here, and the exposure in the MacNamara ground farther off to the north here, and then the exposure in thw 500 Tonopah Mining ground, these indicate that as the fault comes northerly, it has a pretty flat dip, and in the Tonopah mining ground one can see the fault coming into the drift over the roof and curving concave upwards within the heighth of the drift and going off again into the roof of the drift; indicating that there is a very shallow, saucer shaped depression in the dip.

Now, in some of the other levels of the MacNamara up in this region in the neighborhood of stope 13, and in that vicinity,
1031 one can see the Siebert fault splendidly exposed in the roof of these flat stopes. And we can see also the departure of the vein from the fault in that same region. But I refer to these stopes because in the roof of them you can see—above the vein you can see the undulating rolling character of the Siebert Fault, and as you can see it down here on the Tonopah Mining Company's level, so that while we have these exposures we cannot resist the conclusion that the Siebert Fault, has, on the whole, an irregular and rather undulating fault plane. It is not a thing that you can predict to be found in any one particular place along way off by measureing the dip and say that five hundred feet away you will come to it at a certain place. It has an uncertain roll to it and that is, I think, the general characterization of it.

The other characterization that I would refer to is the absence of the mineralization, the softness of the gouge, which I have already referred to.

There is another characteristic which perhaps is worthy mentioning, the Siebert Fault does not, however, as far as I have been able to observe have the same kind of stringer zone connected with it.

Mr. Dickson:

Q. The same kind of what?

A. Stringer zone. Perhaps I should not use the word stringer. I want to say the same accompaniment of the same kind of secondary fissures that would *be* become stringers if they are mineralized.

I have already described the stringer- that are associated
1032 with the vein both above and below it, and the ground in the immediate vicinity of the Siebert Fault, when it is affected by openings not immediately along the plane here affected by a curved

and sub-parallel streaks or fissures, that are not like the breaks that occur in brittle rocks. It is more like the break that occurs in rocks that are somewhat dead or unelastic where the fissures that occur associated with the West End-MacNamara vein rise to stringers by mineralization, and those fissures in that stringer zone are the kind of openings that one would expect in highly elastic brittle rocks, so that I find there is a difference in that respect between the Siebert Fault and the vein, as well as the other distinctions that I have drawn attention to.

Mr. Lindley: I think that is all, professor Lawson.

Cross-examination.

Mr. Dickson:

Q. Professor, you agree with the witnesses who have preceeded you that the Siebert Fault is post-mineral, had nothing to do with the deposition of any of the minerals, in this vein, or any of its branches?

A. I do.

Q. What part does the Siebert Fault play in enabling you to reach a conclusion as to whether there is one vein here with an anticlinal fold, or two separate veins, one dipping to the north and one to the south. Has it any bearing upon that question?

A. Yes.

Q. What is it?

1033 A. I find no abuttment whatsoever *of* the south dipping limb of the anticlinal vein upon the Siebert Fault, except in so far as I have already indicated in such sections as 5-A and 7-A raises. There you have a partial slicing off of the upper part of the vein.

Q. Of the north dipping branch?

A. Well, it is the vein,——

Q. North dipping limb?

A. It is the vein as a whole is sliced off. A portion of the top of the curve is gone, and I find no abuttment or end or terminus of any kind of a south dipping vein against that fault. And to that extent the Siebert Fault has a bearing on that question.

Q. Look at the model for a moment: If the Siebert Fault is encountered in this raise A, a series of raises, professor, and the other places you have indicated you would not expect that to become tangent to the south dipping limb of your anticlinal fold at all, would you? It would be tangent to, and would touch only the north dip?

A. It might be tangent to the very curve.

Q. And it is represented here as being tangent to the very curve in some places?

A. Yes.

Q. Now, that being so, what part does the Siebert Fault play in bringing you to a conclusion that there is not one vein here—that there are not two veins here, one with a northerly dip and the other a southerly dip, but that there is one vein.

Mr. Lindley: I suppose, Mr. Dickson, you will appreciate that the development of the Siebert Fault was necessary in order to
1034 explain the phenomena in the A raises?

Mr. Dickson: The real dispute here is whether there is one or two veins. There has been much time and a very interesting discussion which has been entertaining to all of us on this Siebert Fault. I want to see what part it plays. It had nothing to do with the mineralization, if it has nothing to do with determining whether there is one vein or two veins, I want to know it that is all.

A. I would like to answer that question in this way, Judge Dickson: I would like to say that in so far as these raises follow up on the Siebert Fault, they do not follow up on any northerly dipping vein.

Mr. Dickson: That is all. I will take it up Monday Morning.

The Court: This case is continued until Monday morning at ten o'clock.

1035 22.

December 21st, 1914—Ten o'clock a. m.

The Court: The Jim Butler Tonopah Mining Company, vs. the West End Consolidated Mining Company.

Mr. Lindley: By the courtesy of counsel I desire to ask Mr. Lawson two or three questions which I overlooked on Direct Examination.

Testimony of ANDREW C. LAWSON, who being recalled as a witness on behalf of the Plaintiff, testified as follows, to wit:

Direct examination.

Mr. Lindley:

Q. Mr. Lawson, with reference to a certain vertical cracks that is said to exist in this vein in the neighborhood of the crest of the anticline,—did you observe any phenomenon of that kind underground?

A. Yes.

Q. Will you explain what those cracks were, how they were formed and what effect they have on the vein?

A. They are transverse structures in the vein, developed subsequently to its formation by stresses that have effected the vein; they are not original structures; they are structures that may be said to be superimposed upon the vein after its completion; they are not
1036 original structures; they are sometimes perfectly normal to the vein, and at other times make a considerable angle with it, but in general may be described as transverse secondary structures or cracks. Some of these cracks are very noticeable in the vicinity of the Siebert Fault, and it is very probable that they have been developed by the stresses generated at the time of the Siebert Fault.

Q. With reference to the vein itself, in all its parts, including the north and south legs, and the roll over on the anticline, what have

you to say as to whether or no, this entire vein with its north and south dipping legs and its anticline was formed by the same processes, at practically the same geological period of time, and whether or no it is identical throughout?

A. The observations that I have been able to make upon this vein, show clearly to my mind that it is a single vein, continuous and unbroken and I have been unable to find anywhere any evidence of a break, which could be regarded as in any way separating the vein into two distinct parts.

Mr. Lindley: That is all.

Cross-examination.

Mr. Dickson:

Q. Professor Lawson, I shall repeat the question in a somewhat modified form propounded to you just before Court adjourned Saturday evening,—and I will ask you what light, if any the presence of the Siebert Fault throws upon the question, or sheds upon the questions, as to whether we have but one vein here, namely your anticlinal vein, or two veins, one having a northerly and the other a southerly dip?

1037 A. I have understood that in the contention that there were two veins, that the northerly dipping vein was followed up in the A-Raises; the recognition of the relationship between the Siebert Fault and the West End-MacNamara Vein, makes it clear that those raises do not follow up on any northerly dipping vein, but that they follow up upon the Siebert Fault, and in that respect, in so far as those raises may be considered to be evidence of a northerly dipping vein, the Siebert Fault occupying the position in those raises that it does, indicates that there is no northerly dipping vein, other than the northerly dipping limb of the single West End-MacNamara vein.

Q. Any other light shed upon this issue by the presence of the Siebert Fault?

A. Well, there is this light that in the study of the ground we have evidence of only two important features, one of them being the West End-MacNamara vein, and the other being the Siebert Fault, and that when we eliminate the Siebert Fault from that category it leaves only the West End-MacNamara vein.

Q. Have you stated all the light that is shed upon the question, as to whether we have but one vein or two veins, by the presence of the Siebert Fault, or, as you have found?

A. I am not aware that I have stated all the light that might be shed upon that question, but it seems to me that my answer to your question thus far throws a sufficient light upon the question to settle it in my mind, that there is one vein and one Siebert Fault, and that the Siebert Fault as followed in those raises is not a vein distinct from the northerly dipping limb of the West End-MacNamara vein.

1038 Q. Well, my question is whether you can suggest to the Court any other fact referable to the Siebert fault that

throws any light on the question as to whether we have one or two veins, or whether you have stated all that occurs to you to suggest?

A. Well, of course, there would be considerable light thrown on the question if we were to go over the details of the evidence again. Say that the relationship of the Siebert fault to the northerly limb of the West End MacNamara vein at those places where we can see the departure of the Siebert fault from the vein indicates that we have two separate things. I would say that in so far as we can, by an accumulation of evidence certainly make clear that the Siebert fault is separate, distinct, physically and in time from the West End MacNamara vein, to that extent it throws light upon the question as to whether there is one or two veins.

Q. Well, now, let us see, we will assume—we will not dispute that wherever you have found, been able to identify the Siebert fault, it was later in origin than the formation of this vein, and the completion of the mineralization in the vein. I understand that it nowhere faults the vein except, as you say, in those raises it sliced through and cut off a part of the top in places?

A. Yes sir.

Q. It did not fault and displace the vein anywhere?

A. No sir.

Q. The fact that it is separate, formed at a later period than the formation of the vein, what light does that shed upon the question as to whether you have but one vein here and the anticlinal
1039 fold, or two veins, one having a northerly and the other a southerly dip? This later fissure cutting through the country, what light does it shed upon that issue?

Mr. Lindley: On the genesis of the original vein?

Mr. Dickson: I mean just what I say, Mr. Lindley, what light does it shed upon the question whether we have but one vein here to deal with, or two?

A. Well, of course the answer to that question must be made in the light of what has been contended to be the second vein. And I understand that it is claimed that the A raises run up upon a northerly dipping vein, distinct from the southerly dipping vein. Now, in so far as that fact is brought out, that the A raise does not follow a northerly dipping vein but follows a fault, namely, the Siebert fault, which is tangential to the vein there, it follows clearly that there is no second vein there; that what has been claimed to be the vein is only a later fault.

Q. I think you have already called attention to that.

A. I wanted to make clear that the answer to the question could only be made from a consideration of what was intended to be the second vein, distinct from the West End MacNamara vein. I do not know of any other vein, and I can only answer the question in relation to what is pointed out to me as a vein, and the only thing that I know of that is claimed to be the second vein is this thing that is followed on the A raises, and those are clearly following not the vein, but a fault which slices through the stringer zone of

the vein, and to a slight extent slices through the roll of the vein itself.

1040 Q. Now, if you have finished, I will proceed. Have you anything further you desire to say on that?

A. I think I have answered the question.

Q. The ore and quartz, however small or great it may be, which is found in the 488 raise and the A series of raises, is not at all referable to the Siebert fault, is it, any part of it?

A. The quartz that occurs in those raises is almost wholly, I would not like to be absolutely exclusive there; I would not desire to exclude the possibility of some slight mineralization along the Siebert fault, but as far as my observation goes, the quartz that I have seen in these raises I could say to the extent of over 95 per cent, had nothing to do in genesis with the fault. That it was there before the Siebert fault came into existence. There may be possibly some slight sili-fication, very slight, on the Siebert fault.

Q. Well, if there is any mineralization or sili-fication found there, that is referable to the Siebert fault, it would be negligible, wouldn't it?

A. I should say so.

Q. And as I understand your testimony in direct, the probabilities are but for the Siebert fault, the ore or quartz found in the 4 A raise and the 5 A raise and the other A raises would have been found extending up even further than it does now, or further than it has been followed yet?

A. That is quite possible, except that the——

Q. You spoke of some place where it was cut off by the Siebert fault near the top, at some one or more places?

1041 A. Yes, the stringers are cut off.

Q. It follows, of course, if it had not been cut off, it would have gone up further, if the Siebert fault had not come in there and cut it off?

A. It is very likely so.

Q. Now, those stringers, if you choose so to characterize them, the bodies of quartz, as I claim, found in the 4 A and 5 A and other A raises go up on a dip or inclination conformable to the dip of the North dipping limb of the vein down below the bottom of the raises, do they not?

A. No sir, they do not.

Q. Apparently they do, as you look at it in the ground, do they not?

A. No, I have not seen that appearance.

Q. Just step to the Defendant's model, Exhibit A, for a moment: take the 488 raise, the 2 A, the 4 A, the 5 A, 6 A, 7 A and 262, I think——

A. 461.

Q. 461. If the position, the angle of inclination of those raises is correctly represented on that model in connection with the ore found in the north dipping vein, it would seem to go—they would seem to go up substantially on the same angle of dip, wouldn't they?

A. You wish me to testify as to the appearance——

Q. Just answer the question yes or no, and then give any explanation you please.

A. I wish to understand the question.

Q. Just read the question, please.

(The reporter read the question.)

A. I can not answer yes to that question because those raises that you mention, 461 and 2 A and 4 A and 5 A and 6 A
1042 and 7 A are shown to be all quartz, and there is no indication whatsoever in the representation of that quartz in those models as to the strike or dip of the quartz. So that I can not testify that the quartz follows these raises.

Q. Well, assume for the present that the quartz found in the 4 A raise and the 5 A raise does pursue the course or angle upward of the raises themselves; then, that it would indicate that it went up upon the same angle of dip as the hanging wall of the vein at the bottom?

A. On that assumption, of course, the answer is obvious, they do. I would like to explain that I think the assumption is not founded well in fact.

Q. All right, go on with your explanation.

A. That is all I have to explain. That is all that I desire to say.

Q. Do I understand you to say that if, in your opinion, the ordinary intelligent miner and observer should be taken to the foot of those raises—I do not wish to go over with all of them, we will say 4 A and 5 A—and saw the angle of the inclination of the northerly dipping ore body at the bottom of the raises, observed that and then followed up 4 A, the quartz found in 4 A and 5 A raises that he would observe that there was a difference in the angle of inclination between the stope at the bottom, the north dipping portion of the stope at the bottom, and the quartz found in those two raises?

1043 A. Yes, I should think that an intelligent observer in making observations at that point would be able to see that the quartz in the raises is in a part, at least is not a continuous vein following up the raise—is an aggregation of stringers of various orientation.

Q. Are you familiar with the appearance of the Quartz in the 4-A raise?

A. Yes, I have seen it.

Q. What are its dimensions?

A. Well——

Q. Taking the main body of the quartz from the bottom up, before there is any break in it,—quartz in place?

A. Well, I would not be quite clear in my memory as to the exact dimensions—I should say that there might possible be bodies of quartz there that would measure possibly two feet across.

Q. I am speaking of that quartz that strikes—found at the bottom of the raises and so far as it goes up without any break or interruption,—you say bodies of quartz; I am calling your *your* atten-

tion to the one disclosure of quartz, namely that found in the bottom of the raise 4-A, for instance, on up to the place where we come, if we do come to any interruption, in its upward course?

A. Well, in that particular raise there is perhaps a better showing of quartz there, than in some of the other raises and when you follow,——

Q. Hold on Professor, keep down to the one raise that I am asking you about.

A. The 4-A?

Q. The 4-A.

A. Well, I was proceeding to say that the quartz in that particular raise is perhaps a better showing of quartz than those
1044 in some of the others,—but when you examine the quartz as it comes up against the Siebert Fault, in the roof of the raise it is clear that the quartz was there first, that it had been sliced off by the Siebert Fault, and that you can see the ordinary phenomena that I have referred to indicative of that fact.

Q. Well, take your seat Professor. I wish that you would observe a little more closely the question.

A. I will try to do so.

Q. Please read the question?

(Question read.) The only object that I have in making that suggestion is that it will save time.

A. I should say that, speaking from memory, that the quartz there might have a thickness from two to three feet in the lower part of the raise, and vary somewhat and finally obtain a feather edge at the top.

Q. Confining your attention again Professor to that question of the quartz found in that raise from its bottom upward, until we come to any interruption, if there be any in it, what is the angle of dip of that body of quartz?

A. I should say that it was an angle of dip that was somewhat steeper than the angle of inclination of the raise itself.

Q. Well, about what angle of dip?

A. The raise comes up probably at an angle of about twenty five and the particular body of quartz there has an angle, I suppose, over thirty.

Q. And what is the direction of that quartz in its downward course?

A. The direction,—it is dipping northerly.

1045 Q. How does it come to correspond in direction with the direction of the downward course of the north dipping limb of this vein in that immediate vicinity? I mean the immediate vicinity of Raise, 4-A?

A. It is dipping in such a way as to,—if pursued downward on its dip would impinge upon the south dipping limb of the vein.

Q. You mean the north dipping limb?

A. I mean the south dipping.

Q. Don't understand you. Just point out what you mean.

A. Well, I say that if this body of quartz——

Q. In 4-A?

A. In 4-A Raise were pursued downward on its dip it would impinge upon the southerly dipping limb of the West End-McNamara vein.

Q. It would impinge about on the crest of the roll, wouldn't it?

A. No, it would impinge on the southerly limb of the roll.

Q. Come to Defendant's model, Exhibit-A, and see if the workings there of the 4-A Raise, and the ore found at the bottom of it is correctly represented, would you give the same answer? I will change the question. According to the representation of the 4-A Raise of Defendant's model-A, and of the yellow stoping at the bottom of Four-A Raise and the quartz in it as it follows down would not impinge on the south dipping vein, but would come into the north dipping vein,—wouldn't it?

A. No. On the representation of this model the quartz in this 4-A raise distinctly does impinge on the southerly limb at the bottom of the raise; there is the breadth of the raise for four or five feet, and the color impinges distinctly upon the southerly limb of the fault.

Q. Almost the entire dimensions of the bottom of the winze, as here represented, as here represented as being in the north
1046 dipping ore body,—isn't that true?

A. I did not say so. I would say distinctly that the ore or whatever quartz is in that 4-A raise, if pursued down on the dip at an angle somewhat steeper than the raise must necessarily impinge on the southerly limb of that fold.

Q. I say that if you followed down that quartz to the bottom of the raise, you would come into a stope which has a northerly dip?

A. If the representation of the fact is corrected upon this model, the whole of this raise is quartz, and the quartz followed down here in that raise does, as a matter of fact impinge, and anybody can see it there, impinge upon the surface of that quartz on the southerly side of the crest.

Q. Entirely, or upon the crest?

A. I should say, as nearly as I can judge that it impinges entirely upon the southerly side of the crest line.

Q. Then that model Defendant's Exhibit-A, in that respect must be misleading?

A. I cannot help that.

Q. Well, I say, that model Defendant's Exhibit-A, in that respect must be misleading?

A. Misleading in what?

Q. In respect to the answer that you have just given? If the quartz followed up from the bottom of that raise, 4-A, for the distance upward therefrom that it continues unbroken, is correctly shown, the inclination of it in this raise and the yellow stopeing at the bottom of the raise is correctly shown here, then that quartz which we followed down in the raise until we get to the bottom does not impinge wholly on the southern limb of the fold, but impinges almost entirely upon the northern limb of the fold, does it not?

1047 A. I did not quite catch the drift of that question. Will you please read it.

(Question read.)

A. My answer is no, decidedly no.

Q. That the model does not show that?

A. That the model does not show that.

Q. All right. Now, you have told us, told the Court, called the Court's attention to the light which this Siebert Fault, as found in the 488 and A-series of raises, throws upon the question as to whether we have one vein only to deal with or two veins, one with a southerly and the other with a northerly dip—I will ask you right there Professor, if the Siebert Fault was not there at all, would not you still claim that there was only one vein?

A. I certainly should.

Q. You certainly would. So that whether the Siebert Fault was there or not, in your judgment, there is but one vein?

A. Yes.

Q. What light then does the Siebert Fault throw upon the question of whether there is one or two?

Mr. Lindley: Now, — apprehend if your Honor please,—we have gone over that so often; it is obvious what that situation is.

Mr. Dickson: I don't know I have not been down there.

Mr. Lindley: I mean isn't it obvious from the testimony of the witness; that is a post mineral fault, and it has nothing to do with the formation of the vein, simply explains the situation as it is, and he has said that over and over again.

Mr. Dickson: Well, I haven't taken very long.

Mr. Lindley: I don't object if you want to do that Mr. Dickson, but you will always get to the same jumping off place.

1048 Mr. Dickson: The witness has testified in answer to my question, when asked what light the Siebert Fault shed upon the question, of whether we have only one vein or two veins, that the presence of the Siebert Fault as found in those A-series of raises,—and this last question that if the Siebert Fault was not there at all he would still be of the same opinion; that being so I want to know what additional light, in addition to what he has already said, can be attributed to the Siebert Fault upon that question?

1049 A. It has this bearing on the question——

Q. Anything in addition to what you have already said?

A. Well, if you ask me that question again I will answer it again that it has this bearing on the question: that it negatives any idea or notion that there is a northerly dipping vein followed up in the A raises. Now, that is the only intimation that I have that there could be any other vein. And the identification of the feature that is followed in those A raises as the Siebert fault throws out the possibility of any northerly dipping vein going up those raises, and to that extent it has a very distinct bearing upon the question as to whether there are two veins or not.

Q. That you have already stated.

A. Well, you asked me the question again.

Q. No, I asked you if there was anything in addition to what you had already said. Have you the notes of your examinations, Professor, made during the old MacNamara litigation?

A. I have some of them, sir.

Q. With you here?

A. No sir, they are at the hotel.

Q. Maybe we can get along without them. Would those notes show what works you visited during that examination?

A. They do, yes.

Q. Can you refer to the model, Plaintiff's exhibit 2, and indicated to the Court the most westerly working that you examined during the pendency of that litigation?

A. The most westerly workings?

1050 Q. Yes.

A. I am not clear on that point. I would say that since, of course, the examination was made in the year 1908, there has been a great deal of work done here and I am not quite sure how far out these drifts have been run. But I think that the MacNamara workings have been extended out about as far as the cross cut marked 3 McN. In that neighborhood, certainly, I would not be positive as to the point. I could identify it on the map that I used at that time, but I am not quite sure whether this stope here was driven at that time.

Q. That is No. 10 stope?

A. Number 10. I am not sure that had been driven at that time.

Q. Are you quite sure that Number 9 had been driven at that time?

A. That is my recollection, that the MacNamara mine had been driven out this far at that time (indicating).

Q. Now, going southerly from that, the most westerly working that you examined?

A. I remember distinctly that Porcupine shaft. I examined this level marked on the map 136 level of the Porcupine shaft. I went down the Porcupine shaft to the 172.

Q. Did you go out in that to its westerly terminus?

A. I am not quite clear in my recollection as to the westerly terminus of the 172. But I have a very distinct recollection of going down the Porcupine shaft from the level marked 136 to its bottom.

Q. And going out some distance?

A. Some distance. Not very much, perhaps. I am not

1051 sure, I don't recollect clearly about that.

Q. And where else?

A. In the MacNamara ground? Well, as I say, I think these stopes have largely been driven since.

Q. I wish you would look at your notes at noon.

A. I will do so.

Q. This 300 level which you point out west of the westerly terminus of the stope 9, you were in that?

A. Yes. I have a recollection of being about that far.

Q. Is that in the Fraction dacite breccia?

A. No.

Q. Does the westerly edge of any part of stope come in contact with the fraction dacite breccia?

A. No. Let us see the number, and how far it extends. I think not, no.

Q. Would your notes throw any light upon that?

A. I am afraid not. My notes would only throw light upon the extent of the fraction dacite breccia as it is revealed in the vicinity of the Porcupine shaft.

Q. Did you anywhere then find any portion or point in the vein butting up against or in contact with the fraction dacite breccia?

A. Well, I formed the opinion at that time that the only point on an apex anywhere on the ground that I became familiar with at that examination was below this level 136.

Q. The only what?

A. The only point on an apex that I could recognize at that time must be below this level where this vein that was shown here in those days in this stope here came up against the fraction dacite
1052 breccia.

Q. You did form that opinion?

A. Yes sir.

Q. Did you at that time form an opinion as to where the top or terminal edge of that vein was, what you claim to be the top or terminal edge of that vein was, what you claim to be the top or terminal edge of it?

A. I formed the opinion that at this place in this particular vicinity here below the 136 intermediate level, that there was a point on the upper terminal edge or apex of the vein, but the mine had not been opened up so as to give me any indication of the course of that apex.

Q. What have you at that point, fraction dacite breccia?

A. Fraction dacite breccia, yes.

Q. Is that the only point where you had it?

A. I think that is the only point at that time where I became familiar with the existence of the fraction dacite breccia on that ground.

Q. The workings shown near the westerly end on the south dipping limb in which we find the following markings, W. 664, the bottom of that winze now is in fraction dacite breccia?

A. No, the bottom of that winze is in quartz with a fault slicing through it at the bottom of the winze.

Q. If that were driven even a very short distance further down, don't you think it would come in contact with what you call the Fraction dacite breccia?

A. There is no evidence that it would. It might continue indefinitely in the quartz.

Q. Where do you find the top of the vein there, or do you find it?

1053 A. The top of the vein in that winze?

Q. Yes?

A. The top of the vein?

Q. The top or terminal edge of the vein?

A. I have not found the top or terminal edge of the vein in that winze.

Q. It must be very close to the bottom of that winze?

A. I judge that the situation there is that the fraction dacite breccia must be very close to the top of the vein and lying on it, but not intersecting it.

Q. Come to another place: what level——

A. That is the 6.

Q. The 600 level, near its westerly terminus and where we find 70-B.

A. Looks like 70-B, or 70-B B. 70-B, I suppose.

Mr. Uren: 708.

Mr. Dickson:

(Q.) 708. Do you find the top of your vein there?

A. Yes sir.

Q. At the point represented on this map where the red unites with the yellow?

A. Yes sir.

Q. There you have the top or terminal edge of the vein. How far horizontally, and in what direction is that point on the top or the terminal edge from the crest of your fold, and what is the angle of declination that you had to follow down the dip to the top of your vein at that point?

A. You want the distance?

Q. How far have you had to follow down in the downward course declination that you had to follow down the dip to the top

1054 of your vein?

A. From what point? Starting from what point, Judge?

Q. Starting from any point on the crest.

A. Of the roll.

Q. Nearly directly north of this point, where we have the top shown, where the red and the yellow come together, near the figures 708. Go up on the—I will put it this way; start from this point on the top of your vein where you have the figures 708, and go up on the local dip of the southerly dipping limb, from that point until you come to the crest of your fold and tell the Court how far you have had to follow down from the crest, and in what direction, to get to the top of your vein at that point?

A. The distance from the crest of the anticlinal roll to the point in the vicinity of 708 is in the neighborhood of a thousand feet.

Q. Taking the local dip of the north dipping limb there—the local dip of the south dipping limb between those points, what is it?

A. The local dip of the south dipping limb I presume you mean on the 600 level?

Q. What?

A. The dip on the 600 level?

Q. Can't you give us the local dip of the south dipping vein?

A. When you ask for the local dip you mean the dip at a point.

Q. From where you have the top of the vein or terminal edge of

the vein at 708 up to the point to which you measured and gave the distance of a thousand feet?

1055 A. That would not be a local dip.

Q. Has that south dipping vein any local dip in that vicinity?

A. It has a local dip at all points.

Q. Has it any local dip between these points that you have just measured and given the distance as a thousand feet or something more?

A. You can't say that it has a local dip in that direction because it has many local dips.

Q. So that between the points that you have taken, one where you have the point at the top of the vein at the figures 708, and the point on the crest which you measured to get the distance, the south dipping vein, has no local dip at all?

A. Not in the strict meaning of the term. You can think of a general dip, but as soon as you introduce the word local, or use the word dip unqualified, you mean an observation at a point. And the vein is so unequal in its course and so uneven that it has a great many local dips.

Q. All veins differ locally in dip and strike from the general dip and strike, do they not?

A. Yes, that is true very commonly that there is—the general dip is made up from the consideration of the many observations of the local dips at various points.

Q. Well, if the general dip is made up by many observations of the local dip, can't you give the local dip here between the two points referred to, Professor?

A. I have just stated that that is not consistent with the terminology.

1056 Q. What do you mean by the local dip?

A. I mean the observation for the dip at a point for a very limited region where it is uniform in that region.

Q. Then, I understand you, speaking of this south dipping limb of your vein following upward from where we have a point on its dip to the junction of the red and yellow colors near 708 to the crest, it has no local dip that you can get?

1057 A. My objection is chiefly to committing myself to a terminology that would not be correct. I have stated clearly what the meaning of the word- "local dip" to my mind is. You ask me to do something with those terms which is inconsistent with my definition of it.

Q. Has it or has it not any local dip between that point near 708 where you have the top or apex of the vein, and from there in any direction to the crest, has it any local dip?

A. Not in the definition of the term local dip which I have just given.

Q. Is there any dip?

A. It may be said to have a general dip?

Q. What is the direction of that dip?

A. It may be extremely difficult to determine. You see the plane

has a characteristic undulation, and it would be a difficult matter to do more than compile a great many observations for local dips, and try to arrive at an average on the dip. In a general way, however, one can say that the general dip of the vein, without specifying the degree is——

Mr. Lindley:

Q. You are speaking now of the south dipping limb?

A. The south dipping limb, yes, from the crest of the anticline down to the 600. Another difficulty appears here so that I do not think that I can get the dip, even in a general way down to the point that you have indicated on the 600 level, because the dip has a direction which goes out into space where there is no further vein, and I would not like to testify to the dip of the vein where there isn't any.

Mr. Lindley: Well in a general way. Can't you give the answer in a general way. You know what counsel wants.

1058 A. I can indicate the general dip down on the southerly limb if I am not pinned down to the point 708.

Q. What he wants is the direction, in a southerly direction, of that limb of the anticline, assumed as a distinct entity, in a general way. You do not want it in degrees do you, Mr. Dickson?

Mr. Dickson: Oh, no, just an approximation. I do not want him to take the time to figure it up definitely.

A. This is a matter of judgment, just using the eye to determine the direction of the dip on the model. The direction of the dip would be about twenty-five degrees.

Mr. Dickson:

Q. What?

A. About twenty-five degrees west of south, or east of south. Twenty-five degrees east of south.

Q. Twenty-five degrees west of north?

A. That would not be the direction of the dip. The dip would be down to the south.

Q. What?

A. Twenty-five degrees east of south.

Q. Well, as you follow it up on the dip, ascending on the dip, then it would be north twenty-five degrees west, of course?

A. Yes.

Q. Put up the Plaintiff's cross section will you please?

A. (Witness does so.)

Q. Do you agree with what is represented upon this section No. 1, marked "Finch-4" as to the position of the Siebert Fault shown as coming down the raise—what raise is that?

A. I will look at the section on the map to identify the section. That must be raise 537.

Q. What?

A. I presume that is raise 537, which is projected upon the section.

1059 Q. 537 is a vertical raise as shown upon the model?

A. Well, this is a vertical raise here. 537 is a vertical raise.

Mr. Lindley: The raise where they last struck the Siebert Fault is 533-A.

A. No, it is 537, Judge, that is the raise.

Mr. Dickson:

Q. And what raise is this (indicating)?

A. That is 533-A.

Q. Now, which of those is represented in the raise shown upon "Finch-4"?

A. This is the 537 Raise.

Q. 537?

A. Yes.

Q. This one going up vertically?

A. Yes.

Q. Now this one going up here——

A. I will identify that too. That is intended for the 488 raise, I presume.

Q. That is what I thought. Do you agree with the representation upon this "Finch-4," as to the position of the Siebert Fault in the 488 raise, going down that and then *fa*lttening out as you go north and passing above the 537 raise?

A. The 537 raise, yes.

Q. That accords with your observation?

A. Yes. The Siebert Fault is certainly apparent in the 488 raise and flattens off, and passes above the top of 537, as far as we know.

Q. How recently have you been in the 537 raise?

A. I was up at the top of 537 raise, I think it was about a week ago.

Q. Not since then?

A. I have not been up to the top since then.

1060 Q. Referring to the model for a moment, this 537 raise, which is shown on "Finch-4," section 1, is the raise which connects with what is more likely a drift than a raise, or winze, marked 569. That is the one?

A. Yes.

Q. Now suppose,—by the way you understand that the 537 and 533-A raises are being driven up by the defendant company at the request of the Plaintiff?

A. Yes.

Q. And they were driven up as you understood, at the request of the Plaintiff, with a view to encounter the Siebert Fault?

A. Yes, I understand that to be the intention.

Q. Now, assuming that this 537 raise has been extended up a distance of 60 feet or more above the 569 raise, and has yet, not encountered the Siebert Fault, or any other fault that could be identified as the Siebert Fault, what would — say then has become of your Siebert Fault?

A. I would say that it had probably manifested one of its irregularities or eccentricities.

Q. Or eccentricities?
A. Eccentricities or irregularities which is well known.
Q. You understood that the Siebert Fault has been encountered in the 533 Raise?
A. I know that it has.
Q. You know that it has.
—. ——.
Q. Just about where?
A. At a distance of seventy-six feet from the five hundred level.
Q. How near the top?
A. 76 feet up—at the top.
Q. How would you account for the fact that as encountered there, and it is driven up, driven up sixty-one feet above the 569 Raise, has not encountered it.
1061 A. I should account for it by saying that in all probability the Siebert Fault had taken a roll which it could easily do.

Mr. Lindley: How far up are you on that?
Mr. Dickson: Sixty some feet above the 569 raise, this morning.

Q. If it is encountered at the top of the 533-*A it is certain to be found at all in the 537 from there on up to the distance that I have specified, or it must have had a convulsion there.
A. It must have had.
Q. Turned a good many somersaults?
A. Oh, one would do it.
Mr. Lindley: Calling the attention to the fact—I have not explained to the Court,—this is for your information Mr. Dickson, I simply want to call attention to the fact that the model—there has been three additions made to that model, and one I think is the extension or upward extension of this 533-A, as exhibited in blue; that has been put on since they encountered the fault in that raise. May, I speak of the other one—the other things that have been put upon the model to which the court's attention has not been called.
The connection of the 200-A raise with the 262 at this point here. (Indicating.) The connection between A- and B stopes, the raise here, and the 533 A-raise which is up a distance of 76 feet, where it encountered the Siebert Fault, as testified to by both Mr. Searls—well, I shall call him back on that; Mr. Searls will be recalled upon that,—but that is the fact, Professor.
A. Yes, that is the fact.

Mr. Lindley: And there is one error in the model, that I would like to call attention to,—well, when I put Mr. Searls upon
1062 the stand I will do that.
Mr. Dickson: Well, I wish to recall Mr. Searls for another matter,——
Mr. Lindley: The 569 raise?
Mr. Dickson: Something in that vicinity.

Q. I will ask you to indicate on the map "Finch-4" section 1, where a point of the 537 raise, 61 feet above the 569 raise would fall, indicated on "Finch-4"?

A. At what point shall I begin the measurement in the 569 raise?
Q. In the 537.
A. There is a raise of ten or twelve or fifteen feet, that might be an extension of the raise at the 537.
Q. Take it at the middle and at either side of the 537 Raise, give me the three places.
A. I would like to know where the 61 feet is taken from.
Q. I will ask you to measure from the top of the 569 raise, and where it connects with the 537 raise, above at either side of the 537 raise and midway.
A. At the top of the connection of this winze with the 537 at that point?
Q. Yes.
A. You want me to measure on this map 61 feet?
Q. Yes.
A. It would be at about that point (indicating). Sixty one feet above the top as represented here.
Q. How is it indicated on there?
A. I have indicated it by a pencil mark drawn horizontally.
Q. Mark that a little heavier, and put an arrow pointing to it, with the first letter of your name on the shaft of the arrow. (Indicating.)
A. (Indicating.)
1063 Q. I must correct that question. 61 feet above the bottom of the 569.
A. I will measure out 61 feet, rubbing out the mark that I have already made.
Q. Yes.
A. (Indicating.)
Q. You have indicated that by a pencil line with an arrow pointing to the line, and the letter "L" at the end of the shaft of the arrow?
A. Yes.
Q. What cross cut is this running out here, through which or on which you have indicated it?
A. I presume that is the 400,—that is the 400 cross cut I presume, running out to point 418-A.
Q. It is the 400 West End so marked; the Siebert Fault is nowhere disclosed by that line of work in which you have placed the pencil mark, anywhere from one end to the other is it?
A. Not that I am aware of. There is a fault up at the end of the cross cut?
Q. The Siebert Fault?
A. I don't know whether that is the Siebert Fault or not,—out at the end of the 418-A.
Q. Have you examined it?
A. I have examined it in former times, not recently.
Q. Any gouge in it?
A. There is gouge in it, yes.
Q. Comparable to the Siebert Fault gouge?

A. Well, I judge that it is steeper than I would expect the Siebert Fault gouge to be.

Q. Do you think that is the Siebert Fault?

A. I do not so regard it.

Q. Have you any opinion about it being the Siebert Fault, or some other opinion?

A. Well, my opinion would be, of course, influenced by the
1064 development in the 537 Raise here?

Q. I am asking you if you have any opinion as to whether that fault is the Siebert Fault?

A. I have not hitherto thought of it as the Siebert Fault.

Q. You have not regarded it as the Siebert Fault, or you would not have acquies-ed in having that extended upward to find the Siebert Fault?

A. I have so testified and stated.

Q. Is that Siebert Fault encountered in the 569 raise?

A. The 569 Raise——

Q. That is this raise Professor, so-called raise, 569 Raise appears so marked here.

A. 569 raise, so marked here.

Well, there is a fault in the roof of the raise at a distance of about forty feet from the intersection of the raise with the 537 raise.

Q. Of the Siebert Fault?

A. It is a fault that has some of the characteristics of the Siebert Fault.

Q. In your opinion it is not the Siebert Fault?

A. I would not say that, I would have to plead ignorance as to whether it is or not.

Q. If you were inclined to the opinion that it was the Siebert Fault, you would not have directed or acquies-ed in the direction of having the 537 raise extended on upward, to find the Siebert Fault?

A. As to that point this acquies-ence in that work was a matter of exploration.

Q. A matter of exploration for what?

A. For all the facts that we could find.

1065 Q. For the Siebert Fault among others?

A. Yes, the fact remains that there is in the top of that winze, and followed——

Q. This winze?

A. This winze that goes towards the 569 raise.

Q. Connecting the 569 and the 537?

A. Yes; there is in the roof of that about forty feet south of 537 raise a fault filled with considerable gouge.

Q. Looks like the gouge of the Siebert Fault?

A. Might easily be; it is comparable to it, it is the same sort of thing.

Q. But evidently you did not recognize that, or regard that as the Siebert Fault, or you would not have acquies-ed in the request that the 537 raise be extended on upward above that to find the Siebert Fault?

A. No. It required further exploration to settle the question, and I think that the question is still unsettled.

Q. Is there difficulty in identifying the Siebert Fault, or is it readily identifiable where it is found?

A. Ordinarily it is not difficult to identify it.

Q. Have you ever observed or made an examination of what you called the Oddie rhyolite, Professor?

A. The Oddie rhyolite,-over here on Mount Oddie?

Q. Yes?

A. In years past I have seen it.

Q. Did you hear the testimony of Mr. Finch with respect to the Oddie rhyolite?

A. With respect to the Oddie rhyolite—if I did I don't remember.

Mr. Lindley: The Oddie rhyolite. Are you sure that Mr. Finch mentioned the Oddie rhyolite,—yes, he says that he did.

1066 Mr. Dickson: I will read what he says and ask the professor if he agrees with that. I will read you from the testimony of Mr. Finch in direct examination. Page- 542 and 543. "This Siebert fault as I understand you is the latest phenomena here, geologically speaking, that occurred in that section of the country; it was after the formation of the vein? A. Yes; it is later than anything else except possibly — thing up near the top of the McQuillan shaft, is a little Oddie rhyolite, so called; I assume that it is Oddie rhyolite because Mr. Spur states that it is; that may be later than the Siebert Fault, from the data which we have at hand."

Q. Have you made sufficient of an examination Professor, to bring you to any conclusion as to the relative age of the Oddie rhyolite?

A. I have never even considered that question, Judge.

Q. No, whether that was deposited before or afterward—after the volcanic eruption from which was poured out the Fraction dacite breccia, you have no opinion to offer?

A. No, I have no opinion to offer on that matter.

Q. Is this vein, or these veins here under investigation, a true fissure vein, or is the country rock largely, or to a very considerable extent, from the fissures replaced?

A. The country rock is to a very considerable extent replaced.

Q. At some considerable distance from the fissure?

A. Sometimes, yes.

Q. That of course—that fact would indicate and demonstrate that the rock itself was soluble rock, as well as fractured?

A. I would say that it was susceptible of solution itself in place, we would not call it soluble rock.

1067 Q. In order to replace the country rock the solutions which had that effect must have dissolved out particle by particle the country rock and replace it in the same way, particle by particle with the mineral, so it must have been soluble rock.

A. Yes, it must have been.

Q. And the replacement extended as far from the fissure as forty or fifty feet?

A. Well, it may have extended from the main fissure forty or

fifty feet, in some instances, but probably it did not extend far from the subsidiary fissures.

Q. What?

A. While it may have extended up forty or fifty feet from main fissure, it may have been attacked by water reaching it thr various subsidiary fissures, in the stringer zone.

Q. And it would depend upon two factors, the solubility of rock and the amount of shattering that the fissures would access to these solutions by replacing the country rock; that is t

A. Yes, that a rock soluble under certain conditions woul entirely insoluble under other condition-.

Q. Well, here it must have been quite soluble?

A. Under the temp-ature and pressure and so on, and the ch ical character of the waters, it must have been quite soluble course.

Q. It must have been quite soluble and the effect of these s tions was to replace the country rock.

Mr. Lindley: Well, according to the testimony of the wit there are other factors—that of temp-ature and pressure.

Q. Well, having replaced it to the extent it has from
1068 fissure, the rock which is replaced must have been q soluble?

A. I would say that it was soluble or susceptible of solution u the conditions which prevailed at that time and place. I wo not like to convey the idea that you could take a piece of rock and throw it into a pail of water and it would dissolve.

Q. Oh, no, I mean with the solutions attacking it, it would solve up?

A. Yes, sir.

Q. What in your opinion Professor, was the channel or *or* ch nels of solutions, if there was more than one, through which ascending solutions found their way and deposited their min and metallic contents and thereby built up the ore bodies mineralization found in these veins or this vein?

A. The main avenue of the percolation of the waters concer in the processes was, of course, the main fissure itself.

Q. Where is that?

A. The main fissure is indicated as to its position by the pre position of the vein.

Q. Do I understand you that the main fissure itself was a fis that came from the deep, and the south dipping member of anticline, and went up as a fissure, unbroken over the crest, then in its downward course to the northerly dipping vein?

A. You ask me if I consider that to be the course of moveme of the waters—I did not quite catch the question, I am sorry.

(Question read.)

A. I will answer that Judge with some qualification, I will swer that the fissure exists in the way that you have described now when you ask me whether the fissure came up from the dep

I am not allowed to answer that question, I don't know w

1069 you mean by the fissures coming up from the depths.

Q. I mean by the fissure coming up from the depths, the channel which the solutions followed up from the deep, along the fissure unbroken, along the ore, so far as developed in the south dipping limb of the fold, unbroken fissures themselves, upward unbroken over the crest of the fold, and then down again towards the deep, on the north dipping limb of the fold.

A. That was the course of the fissure on the line of section that you have indicated just now, but not necessarily the course of the movement of the waters which mineralized that fissure.

Q. Well, is there such a fissure having an anticlinal dip or fold generally throughout this mine?

A. There is a fissure which has become mineralized, and has that anticlinal configuration.

Q. And that fissure, in any subsidiary, more or less prior fracturing that may have occurred,—is it your opinion that the channel through which the ascending solution- follwed found their circulation——

A. I think that fissure was permeated by waters that brought into it the mineral matters which we find there, and that necessarily it was an avenue for the movement of the waters, but that is a very different thing from stating that the movement of the waters, had a particular course in the fissure.

Q. Oh, I don't care for that. That was the fissure that afforded the channel for the circulation?

A. Yes.

Q. Now, at the easteriy end of this mine as I understand, the enclosing rock, so far as the vein has been developed to
1070 the east, on the north dipping limb, I mean by including rocks the hanging and foot wall country of the north dipping limb, were the same as the hanging and foot wall rocks enclosing the south dipping limb?

A. Yes.

Q. No distinction that you could observe between the enclosing rocks here on this north dipping portion at the easterly end and the south dipping portion?

A. I do not know of any essential difference; there is a possibility of a difference where the down throw on the Siebert Fault may have brought—I don't say that it has, but it may have brought in this way andesite down against the vein; that is a possibility. But as far as I know, the hanging wall and footwall of the southerly dipping limb, is the same as the hanging wall and foot wall of the northerly dipping limb in the eastern portion of the mine.

Q. And throughout the mine, so far as developed,—is that true?

A. Yes, for particular sections.

Q. Each section taken by itself?

A. Each section taken by itself.

Q. The enclosing walls of the north dipping vein would be the same as the enclosing walls of the south dipping vein?

A. Yes, for the two limbs of the vein respectively.

Q. And in your opinion both limbs of the anticlinal vein, so called, were mineralized at the same time?

A. Yes, sir.

Q. And have you any opinion as to whether that mineralization is referable to solutions ascending from the same source, or were there two sources, one for the south dipping and another for the north dipping vein?

A. I have no reason to believe that there were two sources.

1071 Q. In your opinion there were not?

A. One source?

Q. One source?

A. Yes.

Q. In your sketches, Professor—"Lawson 5, 6, and 7"—in each instance as we face that section are we looking west?

1072 A. May I see the Sections?

Q. (Sections handed to the witness.)

A. In the sketch Lawson 7, we are looking west.

Q. What?

A. In the sketch marked Lawson 7, we are looking west.

Q. What about 6?

A. Similarly, we are looking west in 6.

Q. And in 4 and 5?

A. Section 5; in this section we are looking south.

Q. Looking south?

A. Yes.

Q. That is a northerly and southerly section?

A. That is an east and west section, looking south.

Q. All right. Four?

A. I will just glance at the map to get the exact location of that. That is practically looking south. May be a little east of south.

Q. Didn't you, professor, mark on this Section 4 one place as "Top of vein"?

A. I marked silicified gouge.

Q. You marked one place, I think, as top of the vein.

Mr. Evans: He was going to and did not do it.

Mr. Dickson:

(Q.) I will read you from your testimony on Saturday, Professor, briefly, with reference to your Section Lawson 4. This maybe will draw your attention, as you have the sketch before you. "Now, that is the appearance of the right hand side of the earlier fault as we look at it. On the other side of the fault we have another appearance. I will say that above the Siebert fault here we have the Mizpah trachyte which I will indicate by the

1073 letters M.-T. M.-T. stands for Mizpah trachyte, as the hanging wall of the Siebert fault. Along here for a distance of five feet we can see the top of the vein and it has this configuration, that is the top of the vein (indicating), and I will write on there, "Top of vein."

A. Well, if you will permit it, I will write it on now.

Q. Well, I understood from your testimony you had done it?

A. Well, I evidently wrote (silicified gouge). I will put "top of vein," so as to make it conform with what I stated.

Q. Now, does that represent the top of the vein?

A. It does, sir, for that distance of five feet.

Q. "I will indicate first that this top of the vein has a thickness varying from two to five inches."

A. That is the portion that I had marked "silicified gouge," has a thickness—you see, I indicated by a double line here the top of the face of the vein which I indicated as the silicified gouge."

Q. And which you referred to in your direct statement as top of the vein, and also marked it?

A. Yes.

Q. The top of the vein there is not as thick as the vein found in these raises, is it?

Mr. Lindley: The top of the vein, he says, he meant the silicified gouge.

A. The top of the vein does not mean by any means that that is all of the vein. That is simply an upper layer or top portion of the vein. The top.

Mr. Dickson:

(Q.) Is it the top layer?

1074 A. The top——

Q. Is it as you go upward the extreme top?

A. Well, the top of the vein there is used in the sense of the hanging wall portion of the vein. The upper part.

Q. Well, had you the top of the vein there, Professor?

A. If the word "top" has a technical sense, in the sense of an apex, I did not.

Q. Well, I do not mean—I am not trying to mislead you in that way. But do you have there locally the top of the vein?

A. Yes, I have the top of the vein in the sense that all the vein is below this line here. The vein is below that, and that is the top or upper part of the vein in that particular place.

Mr. Lindley:

(Q.) The hanging wall?

A. And the hanging wall of the vein is right there. And there is a great thickness, several feet of vein below that.

Mr. Dickson:

(Q.) Now, I will have you mark this, Professor, if you will, "LX I."

A. (Witness does so.) That might be mistaken for L 11. L X I.

Q. Is this portion of the sample of the rock on the face of which you have "L X I" gouge with quartz below it?

A. Holding it that way—I would like a little more light on the subject. Yes.

Q. Is that an undurated gouge, or is it soft gouge?

A. Well, it is dry. It is not very hardly indurated. It is dry, but it is not what I would call indurated.

Q. Quite hard?

A. No, it is not particularly hard. I can break it off with
1075 my finger nails and scratch it.

Q. I hand you another sample and will ask you to mark this "L X 2."

A. (Witness so marks same.)

Q. You have so marked it?

A. I have so marked it, "L X 2."

Q. What is the material upon which you have written "L X 2"; I mean that particular part of the sample is quartz, I take it?

A. That is quartz, yes.

Q. I call your attention to this dark colored streak at the top of the quartz on another face of this same sample, and ask you if that is sulphide ore?

A. I think it very probably is.

Q. You haven't any doubt about that, Professor?

A. I should think it would be an ore.

Q. Sulphide ore?

A. Well, there are various dark ores, you know. It might be some of these ores that are not pure sulphides but I would say that it was very likely an ore.

Q. Well, wouldn't you, in your opinion, say that that was sulphide ore, that streak?

A. Well, I should think it very probably has some sulphur in it, and therefore, in that sense, it is sulphide ore, but I would not exclude other things.

Q. Coming back to L X I, for a moment, do you regard the quartz in that specimen and the gouge to which you have referred to as being both vein material?

A. I should regard the gouge as very probably a later thing than the vein.

1076 Q. Where will you draw the distinction between the——

A. I would draw the distinction where the sharp demarkation is between the light gray color and the dark gray color.

Mr. Dickson: I believe that is all.

Redirect examination.

Mr. Lindley:

(Q.) Professor Lawson, I wish you would go to the 400 cross cut just a minute. Is the Siebert fault shown at any point in that level, or in the cross cut, or in the neighborhood of the cross cut?

A. The Siebert fault goes across the mouth of the cross cut.

Mr. Lindley: That is all, Professor.

Testimony of FRED SEARLS, JR., who, being recalled herein as a witness on behalf of the Plaintiff, testified as follows, to wit:

Direct examination.

Mr. Lindley:

(Q.) Mr. Searls, calling your attention to the raise 533 A: since you were on the stand, has that raise been extended?

A. It has been exrended vertically upward to its present height, which is 76 feet above the track of the 500 west end cross
1077 cut.

Q. What is disclosed in the top of that raise?

A. In the very top of the raise, the Siebert fault is disclosed with characteristic gouge, and also characteristic striations of about north, 70 east; a typical exposure.

Q. The other raise referred to, the 537 has not as yet encountered the fault?

A. I believe not.

Q. How long since you have seen the top of that raise?

A. Last Saturday.

Q. How high is the raise?

A. I understand that the present height of the raise is about 106 feet. At the time I was last in it, it was 97 feet.

Q. And it has not, as yet, encountered the fault?

A. It had not at the time I last saw it.

Mr. Lindley: Now, I have no further questions. If you want to take that other matter up with Mr. Uren.

Cross-examination.

Mr. Dickson:

(Q.) In the 533 A raise, you say you encountered the fault at the top of that raise?

A. Yes sir.

Q. Its present top?

A. Yes sir.

Q. Have you there encountered the cap rock?

A. I do not know. The back, the very top of the raise is still in fault material and its certain identification as to the char-
1078 acter of the rock in which the gouged material is is made a little uncertain.

Q. You cannot say whether it is cap rock or not?

A. I cannot.

Q. Where the Siebert fault is found?

A. I cannot. I would like to say further that this disclosure is practically exactly in line with the Siebert fault as portrayed upon the Section Searls 4.

Q. Just where you would expect it. Mr. Searls,—if Mr. Uren is not present, I won't wait for him. There is a piece of work here u-marked on the model Plaintiff's Exhibit 2 which I understand is the Butler working, or in Butler ground?

A. Yes sir.

Q. Do you know by whom it was done?

A. It was done by the West End Company, partially in the Tonopah Mining Company ground.

Q. Will you mark that in some way upon this model so the record will show to what we are pointing?

A. I will mark it C, for connection.

Q. What does it connect? Explain that, and then the record will be clear.

A. This little working marked C on Plaintiff's Model 2, exhibit 2, connects the Tonopah Mining stope 17 with the 569 raise.

Q. Now, I wish you would come for a moment *ot* the Defendant's model, Exhibit A, and point out the same piece of work and mark it C also.

A. (Witness does so.)

Q. Now, the westerly end, especially of what you have
1079 marked C, that piece of work does not occupy the same position in the models Defendant's A and Plaintiff's 2, does it?

A. It does not occupy the same relative position.

Q. How much lower is the top or crest of the end of that piece of work marked C in the Plaintiff's model 2 than is as represented in Defendant's model A?

A. I think about 10 or 12 feet.

Q. Which of these two models is correct in that regard?

A. Neither of them.

1080 Q. What is the error in the representation of this line of work in the Defendant's Model A?

A. Defendant's Model A represents that raise as coming into the 569 raise at a greater elevation relative to the 569 raise than it actually does come in as shown on the ground.

Q. How much?

A. About 2 feet, or 3 feet.

Q. Two feet. That is, the bottom of that piece of work that you have marked C, as shown on the Defendant's Model A, is about 2 feet higher than the fact is?

A. Both bottom and top.

Q. Of course, if the bottom is, the top would be too.

A. It could be distorted.

Q. And the bottom of that same piece of work, as shown on the Plaintiff's Model, Exhibit 2, is how much lower than the bottom as shown upon the Defendant's Exhibit A?

A. About 12 or 14 feet.

Q. About 14 feet?

A. Yes sir.

Q. Now, do you understand that this raise with which that working connects, namely, raise 589, isn't it?

A. 569.

Q. 569 on Defendant's Exhibit A, at the roof of that raise is about the hanging-wall of the south dipping limb of this anticlinal vein?

A. At the point of connection?

Q. Yes.

A. It is within the zone of the hanging-wall stringers, and is above

the hanging-wall of the main solid portion of the vein very slightly.

1081 Q. That is 569 is?

A. Yes sir, at that point.

Q. You do not know whether the material that came from that was sent to the mill, or not, all of that?

A. I do not, but I should think it would very likely be, because——

Q. Merchantable ore?

A. Yes sir; because the raise at that point contains a vein of quartz of about 3 to 4 feet and in portions of it 5 feet in width which shows sulphides.

Q. Now, in the top of the west end of the line of working which you have marked "C" on both models, is that not in ore where it is 14 feet higher than represented on your model?

A. It is in quartz which I think very likely might be ore.

Q. Commercial values?

A. I don't know as to that; but I should suppose it was not unlikely.

Mr. Dickson: That is all.

Redirect examination.

Mr. Lindley:

Q. Mr. Searles, can you explain how that error was made on that model?

A. Why, the error was made because the man who actually constructed the model was not familiar with the ground and simply failed to note that the elevations, as shown on the plan map, Plaintiff's Exhibit 1, correctly show the working at its point of juncture with the 569 raise to be higher than the bottom of that raise.

1082 Q. And the map shows the correct conditions?

A. Yes sir. And the working being in a somewhat obscure position on the model was overlooked by myself when I checked the model.

Q. I would like to have you explain a little further with reference to that raise, Mr. Searls, where you say this commercial ore is.

A. I would like to explain the position of the raise, which is better shown on Defendant's Exhibit "A." The raise in the Tonopah Mining stope in which it was driven, and 569 raise with which it connects. The raise marked here "C" leaves the Tonopah Mining stope at the point where the vein is flattening over to take the northerly roll and dip. And at the bottom of that raise where it leaves the Tonopah Mining stope, the main West End-MacNamara vein, the solid portion of it, can be seen rolling over under the bottom of the raise. And the raise itself was driven up diagonally on a rather steep dipping vein of quartz of a width of from 3 to 5 feet, so that the raise goes up angling, either on the dip or strike.

This vein or stringer is shown throughout the extent of the raise and at its top has a flatter dip than at its bottom and is evincing a tendency to turn over also. The same stringer may be seen in the

side of the 569 raise to come down with a southerly dip and inpinge upon or connect with the solid portion of the vein, which is clearly shown to take a flatter dip and continue along the flat portion of the 569 raise.

Mr. Lindley: Are you through, Mr. Dickson?
Mr. Dickson: No, I am waiting for you to get through.
Mr. Lindley: I am through.

1083 Recross-examination.

Mr. Dickson:

Q. I wish you would point out particularly, Mr. Searls, the point which you have in mind where you say that the MacNamara stope——

A. Tonopah Mining stope.

Q. Tonopah Mining stope, where it connects with that piece of working you have marked "C" is showing the tendency to flatten and go over——

A. I said that the vein, not the stope.

Q. Oh. Where have you indications on the model to show where the vein does that, or flattens?

A. The model there does not correctly represent the quartz as shown in those workings. For instance, the whole raise "C" is not quartz. There is other rock than quartz shown in the raise, and as is approximately indicated upon the model in a small projection of the stope to the north, below the upward continuation of the raise the solid quartz may be seen going into the floor of the raise. The stope at that point is partially filled with dirt that has been thrown down from above. By picking into that at the bottom of the raise, the solid quartz and ore upon which the stope came up may be seen rolling over into the floor of the raise and continuing on to the northward at a very flat angle.

Q. The connecting work marked "C" is not going up on the true dip, but angling and going up obliquely, isn't it true, to the local dip of the south dipping vein?

A. It is not going up upon the main portion of the south dipping vein at all, and it is going up obliquely upon the dip of the vein which it follows.

1084 Q. What vein is that?

A. It is a branch vein or stringer which runs up into the hanging wall of the main West-End-MacNamara vein.

Q. From which, in your judgment, commercial ore was taken from end to end? Is that in the vein or out of the vein?

A. It is within the vein.

Mr. Dickson: That is all.

Mr. Lindley: That is all. I would like to offer in evidence the two patents.

Mr. Dickson: With the admission that the claims *that the claims* are patented, of course I have no objection to your putting them in.

Mr. Lindley: Will you mark these, Mr. Clerk, Plaintiff's Exhibits——

Mr. Colby: Seven and eight.

Mr. Lindley: Now, if your Honor pleases,——

Mr. Dickson: Before you rest, Mr. Lindley, I would suggest that you do not announce that you rest until 2 o'clock. It is possible I may have some questions to ask.

Mr. Lindley: At any time when you want to call back any of my witnesses, if it occurs to you, call them back. We are after what the truth is and you can take them up any time they are here.

But, I was going to suggest to the Court that Mr. Finch, one of our witnesses, who has been in constant attendance upon the case desires to return home tomorrow morning and I would like to ask if there is any objection on the part of either the Court or Counsel to his doing so.

Mr. Dickson: None at all, on the part of Counsel.

1085 Mr. Lindley: If the Court desires to go underground again during our session here, Mr. Searls may take Mr. Finch's place.

Mr. Dickson: I would like to say in that connection that Mr. Wiley is desirous of leaving Wednesday morning; if absolutely indispensible he can remain until Thursday morning, and any time between that and the present, if your Honor should desire to go down, Mr. Wiley will be ready to go with Mr. Searls and your Honor. If the examination that your Honor desires to make can be completed before that time, of course, I do not know.

The Court: I am very willing that the gentlemen shall be released as they desire to be. I find that it will be necessary for me to spend three or four days in that mine, and I would suggest that two gentlemen shall be selected who are to remain here. If Mr. Searls is to remain he will be satisfactory for one side.

Mr. Dickson: Well, Mr. Wiley,—it is quite imperative he should get away from here by Thursday morning, but we were talking this over last evening, thinking it might arise today; if your Honor had not completed the examination you desired to make before Wednesday morning, say, and desired to make any further examination after New Years, and notified us, why, we could have Mr. Wiley return here at whatever time is necessary.

Mr. Lindley: Mr. Searls says he will remain as long as the Court wants.

Mr. Dickson: Mr. Wiley can remain here until Wednesday morning, or, if your Honor desires, until Thursday morning, and if the investigation you desire to make has not then been com-

1086 pleted, he can return here any time, say between the first and tenth of January, if you will give the local Counsel here, Mr. Atkinson, a few days' notice of when you will want him.

Mr. Lindley: Mr. Searles will be glad to come back. We have practically agreed on both sides that after the testimony is in, we will adjourn the case until the 22nd of January for the purposes of argument, if it is agreeable to you.

(Further discussion by Court and Counsel as to time for argument.)

Mr. Dickson: May I have permission to withdraw, in case I want to consult with the witnesses at the noon hour "Finch 4"?

Mr. Lindley: Sure; anything that you want Judge.

The Court: It is understood, then, that the argument will start on the 25th?

Mr. Lindley: That is quite agreeable with me, and I think it is to all of us.

The Court: This case is continued until 2 o'clock this afternoon.

1087 Afternoon Session, Two o'Clock p. m.

The Court: Jim Butler Tonopah Mining Company vs. the West End Consolidated Mining Company.

Mr. Dickson: Mr. Searls, take the stand for a moment. One question only.

Testimony of FRED SEARLS, further cross examination.

Mr. Dickson:

Q. You marked when upon the stand before a line upon Plaintiff's Exhibit one, in pencil, and wrote over it contact vein north and east.

A. Yes, sir.

Q. I understood you to say that all north and east of that line was a contact vein?

A. In a general way that is true, yes.

Q. And that all north and west of it is a fissure vein?

A. Yes, sir.

Q. The line at which the vein becomes tangent to the contact and becomes a contact vein is an irregular one.

Q. I know, but speaking generally I understand that that is not put on with absolute accuracy, but an approximation?

A. Yes, sir that is true.

Q. All northerly and westerly of that line the vein is a fissure vein?

A. Yes, sir.

1088 Mr. Dickson: That is all.

Mr. Lindley: Northerly and westerly?

Mr. Dickson: North and westerly, yes.

The Witness: Southerly and westerly.

Q. Southerly and westerly?

A. And to the north and east it also partakes of certain characteristics of a fissure vein, it does not cease to be a fissure vein when it becomes a contact.

Mr. Dickson: I understand that. If the court please there are some workings that we wish permission to put on our own model. Of course, we cannot do it to day, that is the 494 intermediate from 494 raise a little piece. The connection from the 152 raise to the 4-A raise which has been done by the Plaintiff company, the

continuation since the model was completed of the 533 raise and the 537 raise.

Mr. Lindley: *We,* with reference to that 537 raise, that is a situation which I wish to have some understanding about. We are going on with that raise.

Mr. Dickson: You what?

Mr. Lindley: I want to go on with that raise.

Mr. Dickson: Well, when the testimony closes do you still want to go on with it?

Mr. Lindley: Oh, I do not care anything about it. If you want us to stop why, we will stope it.

Mr. Dickson: I want to know what the state of the case is when we rest, that it all.

Mr. Lindley: I think we should have an understanding that when we submit the case on the evidence the work stops.

Mr. Dickson: Yes, so far as litigation work in concerned.

1089 Mr. Lindley: Litigation work, yes. That is satisfactory?

Mr. Dickson: Yes.

Mr. Lindley: Very well, the Plaintiff rests its case.

Mr. Dickson: Our rebuttal, if your Honor please, I take it will be very brief. I hope to get through with it this afternoon. Mr. Wiley.

Testimony of WALTER H. WILEY, who being recalled herein as a witness on behalf of the defendant, in rebuttal, testified as follows, to wit.

Direct examination.

Mr. Dickson:

Q. Mr. Wiley, have you made, since the commencement of this trial down to the present time,—I mean by that yesterday, a careful examination of the *of the* exposure of the edge of the vein claimed by the other side to be found at the westerly terminus of the vein, where it abuts the so call- Fraction dacite breccia?

A. I have.

Q. And have you made in that connection a careful examination with reference especially to the presence of oxidation along that erminal edge of the vein, and places if any where there was no evidence of oxidation on the edge of the vein itself?

1090 A. I have.

Q. And also of the presence of oxidation at and in what is called by the witness on behalf of the plaintiff, the Fraction dacite breccia?

A. I have.

Q. I wish you would state to the court the result of your observations in those respects.

A. There is oxidation in the quartz and in the country adjacent to what has been called the out-crop, that is, the termination to the west of the north dipping and south dipping veins. As stated in my direct there is rather more oxidation along this line than is com-

mon in the mine. Oxidation is not specially common in this mine as compared with other-, although there are many places indeed in the mine where there is very perceptible oxidation;

The oxidation extends alike into the vein, not exactly alike in all places, but it extends into the vein and into the dacite country adjacent to the vein. In my opinion it in no way represents the oxidation of an outcrop or an edge, which millions of years ago was exposed to the air. It is oxidation which has been formed in comparatively recent times, and in places it is going on to day.

The thing to my mind which convinces me absolutely that this oxidation has happened since the dacite intrusion or the dacite cap covered the vein, is that the dacite itself is oxidized. When it came there whether it be as detrital material through the air, or in the crater of a volcano as lava it was certainly not oxidized, and it is to day oxidized if anything more—I would not say that it is oxidized more, but its oxidation is more perceptible than that of the quartz, perhaps due to the fact that the mass of the dacite is much greater than that of the quartz. It is perceptible in the workings
1091 nearest the top and equally or more striking in the deeper down workings. The deepest workings which shows the edge of the vein is the 600 level and the winze extending below this level.

Q. What winze do you refer to?

A. A winze which extends from the 600 level, known as 664 which starts upon the vein and at its bottom reaches the dacite. The material in that winze and the 600 level is of the nature shown by two samples which I took. This sample which I hold in my hand marked 600 level,—will I mark it something else?

Q. No, that will be sufficient. There is no other sample so marked. Where was that taken Mr. Wiley?

A. It is a sample of dacite in the end of the 600 cross cut, near the edge, it is different in appearance from most of the dacite. It is a very soft rock, so I whittled that end off with my knife and marked it with my knife "600 level." The oxidation extends over a very considerable area in that section.

To show the difference in appearance of the dacite in different places this second sample which is marked "600-W" is from the bottom of the winze 664, at about a hundred feet away, the first sample coming from the end of the 600 level, the second one coming from the bottom of the winze. The winze there starts upon the quartz, the main vein, and at its bottom it cuts square into solid dacite.

Q. Where was this sample "600-W" taken.

A. From the bottom of that winze. It shows the same oxidation only a little more red in appearance than the other sample. So that I think this fact by itself is conclusive, and the explanation of this fact is doubtless that the contact an irregular line it is true, is often faulted and broken, and has formed crevices downward which
1092 water from the surface carrying the atmosphere, the air can easily penetrate and oxidize the material whatever it may be, vein or country rock.

1093 Q. How far out from the so-called terminal edge of the vein in the dacite did you find unmistakable evidences of oxidation in the dacite itself?

A. That varies like the oxidation almost everywhere, very much; on the 300 level there is very little oxidation in the dacite right next to the vein, and then you can — out for 50 feet or so further and you find a great deal of oxidation, and the intervening space in which there is not much oxidation. In the 600 the oxidation is much greater and extends out to the face of the level, a distance of forty or fifty feet on the termination of the vein.

Q. Have you anything further to say upon that?

A. I think that is sufficient.

Q. From your observation of the terminal edge, so called, the evidences of oxidation and all other matters that were observable by you, I will ask you if you found anything that would lead you to modify or change in any respect the testimony that you heretofore gave as to the strike, dip and top of our co-called south dipping and the so-called north dipping?

A. I found nothing, although if permitted, I would like to explain in connection with this dacite, the strike and dip, and the only reason why I called this an edge rather than a top.

Q. Very well, proceed.

A. The edge of the model, which is the term that would naturally be applied to it, shows the reason why I would call it the edge of the vein, which the model represents, but there are cases where, as for instance on the 300 level, there is stope where they have
1094 gone up and the dacite is reached by a raise extending up from the stope; that is, the top of that stope, beyond question in my mind, but again, when they run out on a horizontal working, a drift, and reached this, I call it the end of the drift. The miner who drove his level along the vein and then butted into this eruptive rock certainly did not appreciate that he had reached the top of the vein. He certainly thought he had reached the end, and he had. Another illustration is this winze 664; the vein has been followed in the stopes and raises and various workings from it- real top down to the 600 level and from there a winze has been sunk following the vein. The quartz in the vein and at the bottom it cuts squarely into dacite; the quartz is all gone. You have gone into the eruptive dacite at the bottom; in other words, if the dacite's contact is the top of the vein the miners sunk the winze downward upon the vein and hit the top.

We have there what Judge Lindley has called a "Z-pex," not an apex.

Mr. Lindley: I want to say I am not the originator of that Z-pex; that is one of Max Boehmer's.

A. Well, that is the bottom and the apex is the top, and I presumed that is what you had in mind.

Mr. Lindley: Well, you don't find that in Lindley on Mines, to be sure.

A. Well, at any rate, that is the bottom of the vein, not even the end, and as we come around on the eruptive rock we call it the

apex; in no sense the top, except locally, where, as I said, the stope for instance in the 300 level is cut off as you come up by this
1095 dacite. If, in that connection with that, the top—a few words in explanation of the dip and the strike is permissible, I would like to say that the miner in following his drift almost invariably has gone into that dacite; he was following out on the strike, and the strike of the vein being, as I understand it, as the miner uses that term, in the direction of his drift on a horizontal line, the development in this mine progresses on the north vein toward the MacNamara shaft through cross cuts and drifts on the vein, and on the other side been first cut in the McQuillan shaft. The miner extended his drift out along what he thought was the strike of the vein and he put up his upraises on what he supposed was the dip,——

Mr. Lindley: It seems to me we are traversing a good deal of ground that belonged in the Defendant's main case.

Mr. Dickson: We could not anticipate it very well.

Mr. Lindley: Well, it is the last word.

Mr. Dickson: No, I think Mr. Lindley will agree that it was impossible for us to anticipate that under the pleadings what will be considered the dip on this vein——

Mr. Lindley: Well, I want to say—whether the Court will determinate that this is rebuttal or not—there has not been an objection or ruling since this case started and there will not be. The witness can go on and say all he pleases.

The Witness: Well, just a few words.

Mr. Lindley: I simply wanted to put in a mild protest that this is just the last word.

Mr. Dickson: Well, I don't expect that protest. If this is objected to as rebuttal strictly we can discuss this when we come to the
1096 argument on the case.

Mr. Lindley: Well I want to say to you that I will not lay very much stress upon the question as to whether it is rebuttal or not.

A. Well, I will say simply this: If the strike of this vein is in a north and south direction along the end of this vein, then practically all the drifts on the north vein and the south dipping vein are upon the dip of the vein, and the miner in putting up his raises and sinking his winzes instead of going as he thought he was upon the dip, was going on the strike.

Mr. Dickson:

(Q.) Have you, since you were upon the stand before, heard the testimony on the part of Defendant Company—while it was being introduced, made any examination with a view to the so-called stringer zone or stringer section in the hanging wall and the foot wall of this country as testified to by Mr. Finch and a number of witnesses on the part of the Plaintiff?

Mr. Lindley: With the same protest, the burden of proof upon the Plaintiff, and the same suggestion; I do not wish to interpose a

formal objection but I will leave it to the Court as to whether it is sur-rebuttal or not,—and the witness may continue.

A. Well, then, very briefly I will say that I have——

Mr. Lindley: You need not be brief on my account; I have thrown the door open and you can go on and explain it.

A. I will say that there are many appearances of quartz which did not to me have the form of stringers; in places they are impregnations or replacements of the country rock near the vein; they run in different directions in the vein, and outside of the vein, and they are of different sizes, as claimed by them. Some of the appearances of quartz outside of the vein can be properly called stringers, but I think there are fewer stringers than are common in most
1097 veins of this size, and a great majority of the occurrences which are called stringers, have been called stringers, are simply cross streaks within the vein, which are not exactly parallel with the walls, or in some cases the main, large main, north dipping vein, in all cases I believe where it occurs above what is called the anticline, has been termed a stringer, or a series of stringers, and in my opinion that is the main north dipping vein, simply extending up above the top of the south dipping vein.

Q. Calling your attention to 488 raise, and the 2-A, 4-A, 5, 6, and 7-A raises, I will ask you if you have examined those recently?

A. I have.

Mr. Lindley: Wasn't he examined on this?

Mr. Dickson: Only as to the presence of the Siebert Fault.

Mr. Dickson:

Q. I will ask you if you found any evidence there of the quartz and ore found in those raises having been slashed through and partially cut off carried away by any independent fissure; I mean by independent fissure anything apart from the result of movement upon the hanging wall of the vein itself?

A. I find nothing whatever differing from what I gave in my direct testimony. I find a very plain, distinct——

Mr. Lindley: Now, are you going to repeat.

Mr. Dickson: There is nothing to add.

Q. I will ask you this question. Do you find any evidence there of an independent fissure coming in and cutting off a portion of the ore or quartz—I mean by independent fissure a separate fissure?

A. In my direct I spoke of one fissure in raise 5-A which had been slightly faulted near the apex.

Q. When were you last up 537 raise?

A. This morning.

1098 Q. How far up has that raise been extended?

A. It was 61 feet vertical above the bottom of its connection with the 569 raise.

Q. And what was discovered in that raise from its—throughout that 61 feet in the way of fissure or gouge?

A. There are some fissures near the bottom which are shown upon

the Exhibit Cross section-B, I think of the defendant, and since that cross section has been made the raise has been driven up about forty feet more. I can illustrate the situation plainly by taking the defendant's cross section and the Plaintiff's cross section of the same thing.

Q. All right.

Mr. Lindley: Well, there is no dispute that we have not uncovered the Siebert Fault in that raise. And he has marked upon that raise—Professor Lawson, has marked upon that raise the distance from that and it shows for itself that it has not been encountered.

Mr. Dickson: We want to point out if we can how nearly correct the recent work has shown our sketch to be, and the imperfections that the recent work has disclosed in your corresponding section, if you haven't any objection.

Mr. Lindley: Very well. We admit that they do not agree.

Mr. Dickson: We want to show which is correct.

Mr. Lindley: The correctness of your showing has not been challenged. You have mathematical propositions there, and these are simply geological sketches.

Mr. Dickson: Do you object?

Mr. Lindley: No, it is only part of my continued protest that this is not proper rebuttal.

1099 Mr. Dickson: My continued response to the protest is, that if it is necessary to argue this question when we come to the merits, I think we will be prepared to satisfy the court by a comparatively recent decision, I do not mean the last few years, I mean the last ten or fifteen years, but the Supreme Court of the United States, and the Supreme Court of Montana.

Mr. Lindley: Well, you won't be forced into that situation, I apprehend.

Mr. Dickson: Go ahead.

A. If the court will pardon me, if you can step close to section B, it can be seen. I cannot well bring that over.

The Defendant's section-B is nearly in the same place as the Plaintiff's Section No. 1, marked "Finch-4" they represent, both of them, on the same scale raise 488 extending above raise 569, raise 537 driven above the 500 foot level.

Mr. Dickson: Shown on both?

A. As shown on both sections. They also show with the exception that the north dipping vein is colored yellow on the defendant's section, and what has been called the stringers colored red on the Plaintiff's section, and some differences in the curvature in the portion of the vein, the same thing. The blue upon defendant's cross section along the yellow hanging wall, was put there to show that there had been faulting along that wall, and that in raise 488, as far as shown to the bottom, is what has been called the Siebert Fault, and is the same fault as is shown along the same raise 488 on the Plaintiff's section. The Plaintiff's section dots this same Siebert Fault continuing downward by the blue dashes, it being the same

that is drawn upon Plaintiff's section and actually cut *cut* by
1100 raise 537 near the top of the connecting drift with raise 569.

The extension of raise 537 to a height of 61 feet above the connecting drift with 569 places it as shown upon Plaintiff's section at an elevation higher than the bottom of the cross cut extending from the 400 level. This cross cut is not shown upon section-B. It is not exactly on the section and is not projected, but it is almost on the same section. It is exactly on this section for its first half where it is drawn in full, full line. The effect of this recent work is that it has failed to cut anything in the way of a slip, which could be called the Siebert Fault. So that the projection, which was simply a projection, I should say, and we could not expect it would cut it where it was laid down exactly, but it has failed abs*lo*utely to cut it to the height of the cross cut. At present therefore there is no slip, no Siebert Fault above the hanging wall of the north dipping vein.

Mr. Lindley: At that point.

A. On this line of section. This is absolutely proof. There is a slip at the contact with the cap in the end of this cross cut, but if that slip were the same as the Siebert Fault, then the fault would have to go up on the pitch across this cross cut before it came down again making a letter "S" to connect with this fracture, at the end of the cross cut. There is no such connecting slip shown in the cross cut. If the Siebert Fault is still above the head of this raise it would have to——

Mr. Dickson:

Q. You mean raise 537?

A. This 537, it would have to go up at the inclination approx-
imately shown by my pencil, if it were cut in the next shot,
1101 and it would form therefore, a trough, a steep dipping syn-
cline. The real facts in the case are that this so called Siebert Fault which is the hanging wall of the vein in 488, continues downward as the hanging wall of the vein through raise 537, as shown upon Plaintiff's section-B.

Q. I will ask you since you were upon the stand before, if there has been any new work done in Raise-A, and in a raise easterly thereof?

A. Raise A has been extended up about two feet, and there has been a sort of a drift extending from this in a northerly direction about six feet.

Q. What about the two feet in Raise-A, itself. What does that disclose?

A. There is no material change in the top of the raise. The drift which was driven in a northerly direction has more quartz in it than the top of the raise.

Q. Who did that work the last work you referred to the drift?

A. That was done by the Butler Company.

Q. Have you been in there recently?

A. I have.

Q. You say that there is more quartz there? How much of an exposure of quartz is there in that raise?

A. There is more than three feet of quartz in the northerly end of that raise.

Q. Now, has there been a raise started easterly of A-raise, since you were on the stand before?

A. There is a connection made by a little drift, about fifteen feet long with A-Raise, which follows along the same fraction called the Siebert Fault, which was disclosed in A-raise, and which we call the hanging wall of the north dipping vein.

1102 Q. Now, has there been by the defendant company another raise started east of A-raise, since you were on the stand before?

A. There have been two other little short raises, up only a few feet.

Q. What do thay show?

A. They show that what appeared before to be the hanging wall of the MacNamara stope was, in reality, not the hanging wall. That the wall extends back above that and the quartz and vein matter disclosed in those raises show that the vein is wider at that point, thicker than the wall of the stope before indicated it to be.

Q. How far is the most easterly of those raises east of A-raise? We will ask to have that put on. I did not mention it before.

A. Oh, about fifty feet, I have not measured it but about that.

Q. I will call your attention to what has been called "L-X-1" and ask you if you know where that sample came from?

A. This sample marked "L-X-1" was taken by me from the 400 level of the West End mine in drift 496, 35 feet east of the McQuillan shaft.

Q. Have you anything to say about it?

A. It is a sample of the vein as shown at that point and of the hanging wall of the vein and of the Siebert Fault, what has been called the Siebert Fault. I ground off that edge on the emery wheel just to show the nature of the quartz. It consists of several bands of different colored quartz which lie directly parallel to the gouge which is in the vein on the hanging side. I think it is but fair to

1103 say in this connection that in my opinion, Professor Lawson was right when he said he thought that that gouge was formed after the quartz. I think that is always true of any gouge anywhere, that it is formed afterwards. In some mines, it is being formed to-day. I think the gouge, being the product of attrition and slipping, after the deposition, after the filling of the vein itself, it is necessarily formed. But it illustrates the fact that the Siebert fault is a part of the vein. That it is not only exactly parallel to the banding of the quartz in the vein in this case, but that, as I said is a part of the vein, and in this case it forms and is the hanging wall of the north dipping vein.

Q. I will call your attention, Mr. Wiley, to a sample or rock marked "Lawson 9" and ask you if you find quartz of a similar honeycombed appearance down in the mine?

A. This sample, Lawson No. 9, is a sample of nearly solid quartz through which there are numerous vuggs or holes, and while it is in a sense honeycombed quartz and it often occurs near the outcrop of veins, where, for instance, the iron pyrites is dissolved out by the air

and the holes which were occupied by the pyrites remains, it is often more common near the surface of the veins than in depths; still, these holes are exactly similar, and this face is similar to other pieces which can be found throughout the mine in a hundred, or maybe a thousand, if you hunted enough, different places, and are in no sense the result of surface oxidation.

Q. Have you any other samples which you wish to——

A. I have not.

Mr. Dickson: That is all.

1104 Cross-examination.

Mr. Lindley:

(Q.) Have you been in raise 533 A?

A. I have not.

Q. You have not seen the exposure——

A. I have been there, but not since the new work was done.

Q. But since they encountered what our witnesses testified to be the Siebert fault?

A. I have not.

Q. You did not feel it was necessary to go there, I suppose?

A. No, I did not.

Q. Now, if you can concede for a moment that this vein is a rolling, anticlinal vein, and not two veins, that it is continuous from the bottom of the southerly dipping limb to the extent that it is developed in the northerly dipping vein, where is there a terminal edge of it?

A. There is a plainly defined terminal edge of the south dipping vein.

Q. I am speaking now of the conception for the moment, if you please, of one vein, not two veins?

A. Oh, if it is an unbroken fold, it would have no terminal edge.

Q. Is there no place where the vein terminates in the ground in dispute?

A. Well, it might have a terminal end and a terminal bottom, but not a terminal top.

Q. It might have. I am not asking you about a bottom
1105 or top. I am asking you for a terminal edge of this vein, regardless of whether there is a course downward from it or not? I want to know where the terminal edge is upon the theory that this is an anticlinal vein, as has been testified to by our witnesses? Where is there a terminal edge in the ground?

A. Is the bottom of a thing the edge? I suppose it is, isn't it?

Q. Yes sir.

A. In the sense that the edge of anything is the termination of it, simply terminates when you reach the dacite.

Q. That is what we call fraction dacite breccia?

A. It is.

Q. Which was there first, the vein or the fraction dacite breccia?

A. The vein.

Q. Well then, this question of oxidization is not material is it?

A. I do not think it is material in any sense of the word, personally, but I do think that the claims which were made as regards the oxidation were incorrect.

Q. Well, perhaps, but it is your conception of this vein that the edge existed before that material was evolved from the volcanic action, whether it may be an eruption or a falling on the vein, the vein was there first unquestionably?

A. The vein was there. It doubtless terminated some where, as all veins terminate. They terminate in the country rock, through dying out but——

Q. Are you prepared to say that this was not an original
1106 surface, what we call the dacite flow, what we call the fraction dacite breccia came out there, that that was the terminal edge and had been formed in the first place and it simply covered it up?

A. I am prepared to say that there was a surface somewhere, certainly.

Q. Was not that the surface at that time?

A. I can answer that fully and fairly, I think.

Q. All right; answer it.

A. I am not prepared to believe that every point on the present end of that vein is undisturbed in the position in which it was originally formed. I believe that the vein continued very much further into this volcanic crater of Brougher mountain and was very much disturbed, how much I do not know; haven't the slightest idea.

Q. Is that any suggestion, in your mind, Mr. Wilie, that this vein was faulted at that point and the remnant of it has been thrown somewhere else?

A. Yes, there are many points along that which not only indicate faulting, but actual slips.

Q. To such an extent as would enable you to correlate all those observations and determine the fact of the faulting?

A. To determine absolutely the fact of faulting, but not the extent. I do not believe—at least I have been unable to trace any one fault of enormous extent which slices off that whole vein; I do not think for a moment that happened, no.

Q. When, then the question of oxidization is really an immaterial
one as long as you realized that the vein was there before
1107 what covered it came up, is it not?

A. Well, it is immaterial, except as you may want to prove that that actual spot was the end.

Q. Well, that is the only end that we know of in modern times, when the vein was first discovered in the McQuillan shaft, wasn't it?

A. That we know as the vein actually exists, by no means, no. Still, assuming a fold—trying to forget all these facts that actually exist?

Q. No, I am taking the vein as we find it. The interpretation of the phenomena which you find there indicates clearly that what you call the dacite, what we call the fraction dacite breccia, came on to that vein after the vein was formed in its present position?

A. Yes.

Q. That is true?
A. Substantially.
Q. Well, would you say that that was a buried outcrop?
A. No, I would not call this an outcrop at all. It may never have come to the surface.
Q. Wasn't it a part of the original surface?
A. There was an original surface, but——
Q. Wasn't it a part of the original surface?
A. The exact edge as it exists to-day, I think not. How far it extends beyond that I do not know.
Q. How far is raise 537 from the plane of your section—of our section I?
A. 30 feet. That is raise 537 is 30 feet east of your Section 1.
Q. Where is raise 533 A with reference to that section?
1108 A. 533 A is 75 feet west of your section No. 1.
Q. How many feet?
A. Seventy-five.
Q. Seventy-five feet?
A. Yes.
Q. Now, look at your section C, for instance, and tell us if that is a fair demonstration of the fact that you know to exist in that mine in reference to the position of your fault?
A. 533 A shows the fault marked above the head of the raise 2 A, that is, it is shown in blue as the hanging wall of the vein, and in blue because there has been faulting. It is extended down as far as developed into a short distance below. Beyond that, it is not marked. The vein is continued through and raise 533 A is shown as going up through the north dipping vein to the height it was at that time. It is a fair representation of the facts as they were then, and probably as they are now.
Q. You did not know of the existence of that fault in that section at the time that section was made, did you?
A. This fault which is cut almost exactly where we have shown the contact between the trachyte and the cap is, while I have not seen it, I won't attempt to describe it, I simply call attention to the fact, it is cut just about or near where we have shown the contact, and there has been faulting along nearly all these contacts, so I could expect to find a fault at that point.
Q. Well, if you showed it where it is, it would be separate from the hanging wall of your vein, wouldn't it?
A. This fault you have got would be near the contact of the overlying rock, and above the hanging wall of the vein, yes.
1109 Q. Above the hanging wall of the vein?
A. Yes.
Q. How far above?
A. How high up is it cut?
Q. Seventy-six feet.
A. About twenty-two feet above the hanging wall, as shown here, and just above five feet below where the cap is marked upon that cross section.

Mr. Lindley: That is all. Let me see those last exhibits. There ought to be some—Wilie what? Mr. Wilie, will you kindly hand me the exhibits that you put in here.

1110 The Court: If marked with numbers, that would be Wiley 8 and 9.

Mr. Lindley: Well, it ought to be marked so that there would be some way of identifying that.

Mr. Colby: Wiley eight and nine in the sequence.

Mr. Lindley: Well let Mr. Wiley mark them. (Witness marking exhibit.)

Mr. Dickson: Is that all.

Mr. Lindley: Yes.

Testimony of HORACE V. WINCHELL, — being recalled herein as a witness on behalf of the defendant in rebuttal testified as follows, to wit.

Direct examination.

Mr. Dickson:

Q. Mr. Winchell, have you made a careful examination of what was called by the other side the terminal edge of this vein in its westerly course?

A. I have.

Q. And of the Fraction dacite breccia in contact with it and extending out westerly from it?

A. I have.

Q. I wish you would state to the court what observations you made and the result of them?

A. The dacite breccia which upon the occasion of my former testimony, I designated as the Brougher dacite breccia,—and is now called the Fraction dacite breccia by the defendants,—

1111 is found at many places in the mine workings, in the western portion of the mine; it is not found alone exhibited at what has been termed the western terminal edge of the vein, but it has been found in some of the stopes and its relation to the vein is commonly that of an eruptive contact.

Q. And eruptive what?

A. Contact with faulting phenomena. Thus for instance with the stope above the four hundred level we have extending to the eastward—I can illustrate it upon defendant's model if you will permit me,—upon the model Defendant's Exhibit-A, there is a gap in the stope to a considerable extent.

Q. Designate the place as near as you can for the record.

A. It is immediately above the 401 drift, and is noticeable above the top of the 415-raise, easterly and westerly from that point. As you pass through the stopes in this vicinity you will notice the southern edge of the stope marked by a very much oxidized brownish red and some times yellowish band of dacite breccia. It shows extending out perhaps two hundred feet, intruded into the vein in that part of the ground. Considerable oxidation has resulted

there from the percolation of waters downward along this intrusive dyke or wedge of material. We have further north——

Q. Before you give that point, I will ask you whether or no the material that you find there, which you speak of as intrusive, is the same material that is spoken of by the witnesses on the other side, as the Fraction dacite breccia?

A. It is a portion of the same material although in this position it is not so fragmental; it is of more even grain, and more of the texture of an intrusive rock, than of the volcanic fragmental
1112 rock. Upon the 600 level just near the western end, and east of winze 664, we have another case of the dacite breccia intruding and cutting across the broken edge of the quartz for a distance of from twenty-five to thirty-five feet, and penetrating that quartz. In the MacNamara stope near the west end we have working stopes abutted against the dacite breccia, and many examples of the nature of the contact; and here invariably we find dacite not always typical breccia but sometimes rather that of an intrusive homogeneous dacite eruptive abutting against the quartz; terminating it, and displaying fault movement. In other words, the contact generally in most cases where observed in the ground between the quartz and the dacite breccia is that of intrusion or eruptive contact with faulting.

Q. As distinguished from the faulting down?

A. As distinguished from the appearance of a shower of volcanic ashes upon the upper edge of the vein at the western terminal edge of the 300 level. We have another spot with contact oxidation phenomena abundantly displayed; the dacite itself is rather more oxidized, much more oxidized than the quartz, but as we go westerly from the immediate vicinity of the plane of contact, the dacite becomes less oxidized indicating that the waters which produced the oxidation in both the quartz and dacite penetrated along the contact; as we go further west in the dacite breccia we find there evidences of movement, along which surface waters have again penetrated and again produced the phenomena of oxidation; at the terminal edge of the vein west on the 300 level west end, we find the quartz similarly abutting against the dacite; it is further noticeable that in every instance the plane of contact between the dacite breccia and the quartz is not an overlapping, although there are places as shown in 484, where the dacite breccia does rest upon
1113 the top or hanging wall of the quartz, yet at the terminal edge the plane of contact is steep, from forty-five degrees vertical, and not that of a gentle outcropping slope as indicated upon the block model which Mr. Finch has produced. At this terminal edge upon the 300 level west, a drift, a short drift about two or three rounds of shots, has been driven since I delivered my testimony in chief—I suppose for the purpose of ascertaining the precise shape.

Q. Do you know who did that work?

A. It was done at the request of the Plaintiff—and it shows that the vein must have been indeed projected some distance above the surface at that point, if it were an outcropping or projecting vein,

because the eruptive rock lies under the edge of the vein; the vein is not directly supported upon the trachyte, its country rock, but the dacite breccia underlies it and the contact t-ere is not a west dipping or a southerly dipping but a steeply east-dipping plane of contact. This breccia lies as we all know in the edge of a volcanic neck, Brougher Mountain, and has been discharged from it. It is not ten miles away nor one mile, nor a thousand feet, but immediately in that vicinity; and upon Brougher Mountain you find the volcanic rock itself exhibited in the shape of basaltic columns some of which has been quarried for building stone rock in Tonopah. We find furthermore evidences of eruptive explosive action in the large and small, angular, not at all rounded, weather-worn fragments of quartz thrown out from the vein and included in the dacite breccia some distance away from the terminal edge, and if in a position where it *was* at some time have been covered over by a shower of ashes must have been suspended in the atmosphere during that shower.

1114 I have a sample which I should like to show illustrating this point. How shall I mark this?

The Court: I think that it is Winchell No. 1.

A. The sample which I hold in my hand is marked upon the tag "Winchell-1" it represents a fragment of almost retangular shape about five inches in length and three inches in width, honeycombed in the characteristic fashion of the quartz of this vein, containing partially replaced trachyte, fragment such as the vein exhibits,—both veins exhibit everywhere—and surrounded by the dacite breccia. This sample to my mind, is an evidence of the nature of the explosive force which caused the terminal edge of the vein—produced it.

Q. What explosive do you refer to?

A. Explosive disrupting action of a volcano. I don't believe that there was any terminal edge there until the volcano blew out a segment of the vein and produced the terminal edge which we find in the ground to day.

Q. Where was that sample taken from Mr. Winchell?

A. That sample was taken a few feet west of the terminal edge of the vein as exposed upon the 300 level of the West End Mine.

Q. I call your attention to the sample marked "L-2" and ask you if you know where that was taken from, if you can point it out on the defendant's model Exhibit-A.

A. I do know and I can point it out on the model and upon the plan map, Plaintiff's Exhibit-1. I have several other fragments of the same material taken from the same place. This is a sample of ore containing sulphide silver minerals, manganese minerals, either the carbonate or silicate of manganese, and banded quartz, it displays no evidences of oxidation; it discloses the——

[Page 1115 of manuscript omitted in original transcript.]

1116 reached by the workings in the mine, and it displays abundant cavities of dissolution, and cavities in which the quartz

has not entirely replaced the fragments of original material, the included trachyte, and in which the soft kaolinized trachyte has been removed.

Sample marked "Winchell-3" is a sample of ixidized iron stained quartz taken from stope 500-C, the large stope in the eastern portion of the mine just above the 600 level, therefore at great depth; this oxidation is striking, but upon exposing the freshly broken vein we discover the ore to be of unusual richness, the several minerals in bands reaching a thickness of about a half an inch, and the ore of unusual high grade and oxidized, at one of the lowest points reached by the mine's workings; except for additional samples above stope 338, that is all the samples that I have.

Q. From all of your observations, examination made along this so-called terminal edge, since you were last upon the stand, I will ask you whether — have detected anything which would lead you to modify the opinion which you gave when before upon the stand, as to the strike, dip and top or apex of the north dipping and south dipping veins, or either one of them.

Mr. Lindley: Well, he would be something more than human if he would come back and contradict his original testimony. That is not rebuttal to ask him if he has changed his mind.

Mr. Dickson: I asked him if he had seen anything since your witnesses had testified,—I——

(Further discussion between counsel.)

Mr. Dickson: We had no reason to apprehend any such claim as this, and I ask him in view of this, when he went back,—in view of the testimony given upon the other side, and the
1117 light that that testimony shed upon this case, and on his subsequent examination whether he discovered anything which modifies his opinion as to strike or dip or top of either one of these veins.

A. I have not discovered anything which leads me to change my opinion, which is my positive conviction as to the structural and genetic relations of these veins.

Q. What have you, if anything, to say Mr. Winchell, about the so called stringer zone in the hanging and foot wall of this vein or these veins?

A. In my testimony in chief I referred to some north and south bands of silica with a generally steep dip, nearly vertical or steeply dipping to the east, which I mentioned as underlying the line of intersection of the north dipping and south dipping vein. If those can be called stringers then I am willing to subscribe to the opinion that there are stringers beneath the vein, but I have already given or mentioned the facts, which leads me to believe that those north and south bands of quartz were deposited prior to the formation of either the north or south dipping vein.

Mr. Lindley: Is this going to be a repetition of his direct testimony?

The Witness: No, I am not going to tell you——

Mr. Lindley: I am going to move to strike it out. This is simply

a re-argument of the whole thing that has already been brought out in the first instance.

The Court: As to that, this is called rebuttal, and I think that it is correctly called so, speaking generally there is no objection on the part of this court and there never has been to what might
1118 be called sur-rebuttal, so the last word proposition is just as much applicable to one side as the other, and, as to each side, finishes I suppose——

Mr. Dickson: Personally I care nothing about what the witness is speaking of. I will direct his attention to the so called stringer zone, and I will confine it to the stringer zone in the hanging wall country respecting which he had no occasion——

The Court: I think that it would be well to avoid repeating the original testimony, and to bring out the points which are new.

A. I will endeavor to do so. I wish to guard against excluding something which might be regarded as stringers, which I have already described. I have searched in the country above and below these veins for evidences of the halo or stringer zone. In the vicinity of the junction point of the Fraction vein and the main south dipping vein, the trachyte has been shattered in that vicinity as disclosed in 712 cross cut of the Tonopah or Jim Butler Mining company, I don't remember which, we find considerable fracturing and the formation of the bands of quartz. In the hanging wall country of both the north dipping and southerly dipping vein, there is a conspicuous absence of such stringers where the stopes have reached unquestioned trachyte. Upon the hanging there is occasionally a little quartz seam running in any particular direction extending upward; but usually the trachyte is not fissured and full of quartz stringers, and what stringers there are do not lie parallel generally to the dip of the main vein; within the vein itself there are sometimes bands and streaks of quartz running in various direction-, representing original fractures in the included mass of rock, which has now been changed into vein material.

1119 Q. In reference to what has been said of the Siebert Fault, and the 488 Raise and the A-series of raises, I will ask you to state whether or no you have observed—have been able to detect evidence of any fissure other than the vein fissure itself which has slashed through those raises and cut off a portion of the quartz or ore upon which the several raises have been driven upward?

A. I see no fissure anywhere cutting and displacing the north dipping vein.

Mr. Dickson: That is all.

Cross-examination.

Mr. Lindley:

Q. How many terminal edges do you find in this vein, assuming it to be one vein and not two?

A. One.

Q. Where is it?

A. One complete terminal edge?
Q. Where is it?
A. And other partial terminal edges.
Q. Where is the complete terminal edge?
A. It is exposed in the western portion of the mine at the upper edge of the stopes and raises, and in the drift extending westward into the neck of the volcano.
Q. Which was there first, the vein or the neck of the volcano?
A. The vein was there first and it was disruptured and blown into smithereens by the volcano.
Q. After the volcano had spent itself and blown this vein into smithereens, that constituted the terminal edge of the vein didn't it?
A. Yes.
1120 Q. And if that left an original surface that would be an outcrop wouldn't it, if it was left——
A. If what left an original surface?
Q. The tearing off of the vein?
A. Well, it did not.
Q. You say that there was no original surface there?
A. I say there was not.
Q. And you say that the Fraction dacite breccia is something that erupted from the neck of a volcano?
A. Yes.
Q. You are sure of that?
A. Yes.
Q. Then the crater must have been right there?
A. In that vicinity?
Q. Well if it erupted, came up, it must have been in the crater movement?
A. Not necessarily in the center of the crater, but it must have been within the zone of explosive action.
Q. Do you classify what we call the Fraction dacite breccia with the Brougher Mountain dacite?
A. Yes.
Q. There is a coulmnal structure to the Brougher Mountain dacite?
A. Yes, there is in the middle of this volcano.
Q. That you can stand on the streets of Tonopah and see?
A. Yes.
Q. Do you see any structure of that kind in the neighborhood of the West End workings, or West End-MacNamara workings?
A. No, that structure is not exhibited there, because the material is largely fragmental, nevertheless it represents a part of the same general volcanic mass.
Q. Have you ever analyzed that rock, either chemically or under a microscope?
—. I have not.
Q. That is this Fraction dacite breccia,—have you ever
1121 examined the Brougher Mountain dacite under a microscope or chemically?
A. No.
Q. They are the same?

A. Part of the same volcanic——

Q. They are the same——

A. There may have been mingled with what you call the Fraction dacite breccia, likewise volcanic material from volcanoes in the vicinity, but in general they are part of the same eruptive mass.

Q. Or in other words there was a sort of family of volcanoes at work at that time?

A. I presume that there was a little clan of them.

Q. A little combination of them?

A. Yes.

Q. And you called the whole material dacite?

A. Dacite breccia.

Q. You did not think it was important enough to determine as far as the genesis of this was concerned, the Brougher Mountain, or the Fraction dacite breccia?

A. I think there is some similarity in appearance.

1122 Q. But from the same volcano, the same crater?

A. I haven't any doubt of it.

Q. Well, if we concede for a moment that you p-ssibly might be wrong in some of your deductions, possibly, although you seem to be very certain about it——

Mr. Dickson: No more so than some of the gentlemen on the other side.

Mr. Lindley: Perhaps not quite so much so through lack of faith.

Mr. Dickson: Well, maybe something else than a lack of faith, too.

Mr. Lindley:

(Q.) Mr. Winchell, assuming that this is all one vein, perhaps it is our mistake, that is for his Honor to tell; at present I do not mean any reflection on the witness or on Counsel. That this is all one vein, that is to say it is an anticlinal vein as described by the gentlemen who have testified in behalf of the Plaintiff in this case, where is the top?

A. I thank you for suggesting the reason for my positiveness, namely, my entire conviction. It is difficult for me to assume that it is all one vein in the face of the structural evidence that the south dipping vein has a top and apex against the north dipping vein, but I will assume——

Q. Yes, please.

A. And then I should say that the top or apex is the highest point to which a miner could follow ore from his level upward upon the dip of the vein.

Q. In other words, the crest of the anticline is the apex?

A. Yes sir.

Q. Were you ever at Leadville?

1123 A. Yes.

Q. Do you get your ideas from conditions in Leadville?

A. I base my ideas upon the conditions in this ground and with entire knowledge of the conditions in Leadville; that is, with a general knowledge.

Q. In other words, you think the apex of a vein is the top of an anticlinal fold?

Mr. Dickson: Wait a moment.

Mr. Lindley: This is proper cross examination.

Mr. Dickson: I do not know whether it is or not. My understanding and belief is, and it is derived too, from the teachings of my learned friend, that the facts in the Leadville region where they have the so called blanket veins, bear practically no analogy to a single anticlinal fold such as we have here.

(Further discussion by Counsel.)

Mr. Lindley: That is all, Mr. Winchell.

Mr. Dickson: That is all, Mr. Winchell.

Mr. Clerk, will you get me the answer in the case of the West End Consolidated Mining Company against the Jim Butler Tonopah Mining Company?

Mr. Lindley: If Counsel will state what he wants to prove, I may admit it.

Mr. Dickson: I will simply make the offer, reading into the record that paragraph.

Mr. Lindley: The situation is this, if your Honor please, in order that you may weigh the simple suggestion that it is not rebuttal. The Jim Butler Mining Company ascertained in January by an open connection with the West End Company that they were working a vein that was underneath their vertical planes. Of course, the Jim Butler Company had not participated in the early development of the structural conditions of this vein in either the MacNamara or West End or Tonopah Extension troubles, knew nothing about it. And it has taken some time to develop the actual situation. And it appears that during the course of time, some time during the progress of the development that one of the engineers in this case developed facts sufficient to determine that, in his judgment, at least, the western terminus of this vein against the Fraction dacite breccia was the top of the vein.

1124

The replication was filed in this case before the facts were known to the Counsel who prepared the replication, and before the Counsel in the case could be convinced that that was a proper defense to the action. That is the truth of the matter. Later on, the West End Mining Company commenced a counter suit based upon the fraction vein, a vein which so far as this case is concerned, is a secondary one, and it is so alleged in the pleadings, crossing the West End side lines.

Mr. Alling: One moment, Mr. Lindley. This is not a matter that is before the Court. If Mr. Lindley desires to have it regarded as evidence, we are perfectly willing that it should be so regarded, provided Mr. Lindley will permit us to cross examine him, or the Butler people concerning their claim of not having any earlier knowledge of that western condition. Now, Mr. Lindley may not have that knowledge. But Mr. Lindley will admit, doubtless, what Mr. Finch said upon the stand, that the fact that there was a broken edge on the West was town talk.

1125 Mr. Lindley: Well, I do not suppose that Mr. Finch could have acquired any knowledge of town talk until he came to town, and that would not happen until long after the trespass of the West End into the Jim Butler ground, and until after probably the discoveries were made.

I simply want to illustrate the fact that when the Fraction suit was brought we made the specific allegation that this was either an anticlinal vein, or [illegible] crossed the side lines in the answer to the Fraction vein suit. The denials in the replication in the Jim Butler suit against the West End denied that there was any vein that crossed the end lines and in its downward course entered underneath the Butler surface. And Mr. Dickson was kind enough to say, when the question was before the Court previously, referring to this when I asked him the object of the question, that he considered that the answer or the replication in this case was sufficient to cover the issues and it was not necessary to amend, so far as the allegations of the vein crossing the side lines are concerned.

Now, I think it is entirely irrelevant and immaterial and incompetent, and almost impertinent for a gentleman of the distinction of Mr. Dickson to offer in evidence an instrument of this character with all the varied denials that there are in it, and insist that it is an estoppel upon our part when the true facts have been developed in this case. He may have a justifiable theory for it, but I think it is a mistake. That is a pleading in -hat case. It is not an estoppel, it is not urged as an estoppel, and it could not be in any event, it being filed subsequent in another piece of litigation which is entirely
1126 based upon another cause of action. Now, that is my view of that answer. We have had this same thing under discussion before.

Mr. Dickson: I never consciously offer anything in evidence that is impertinent. My duty, as every lawyer's duty to his client, constrains him to offer everything in evidence that he thinks is competent and has any—material bearing upon the issues. If he fails to do so, he fails to discharge his full duty to his client. Now, I care not to discuss this further.

I offer a paragraph of this answer filed only a few weeks ago, on the 16th day of last month, for the purpose of showing that according to the light that the Defendant then had, as recently as that, they did not know whether to base its claim here upon the theory that this vein having an anticlinal roll that it had no top, or to base it upon the contention that it did have a top or apex in this vein, but that top or apex crossed the side lines of this plane.

This case has been pending for many months; ever since last April. As is developed before your Honor, these eminent experts have been here examining this ground from an early day after the commencement of this suit, repeated examinations, and yet must it be assumed that the Defendant when it interposed this answer had the benefit of all the light that its experts were then able to furnish it with; it is manifest from a paragraph of the answer that the Defendant then was uncertain on this all-important and vital issue.

Mr. Lindley: Well, I confess, if your Honor please, I am uncer-

tain yet, as far as that is concerned, and I confess to the Court
1127 very frankly, as I did the other day, that I am in hopes that we won't have to depend on it for many reasons, and I thought I was very frank in my statement at the time for the benefit of counsel and for the benefit of the Court. But out of the superabundance of precaution, it is put in there.

I object to this and ask the Court to reserve its ruling until we argue the case.

Mr. Dickson: I have no objection to that. I offer the whole answer, but the one paragraph particularly——

Mr. Lindley: Of course, you must take the pleadings as a whole by four corners.

Mr. Dickson: That is what I was saying. I offer the whole of it, but the only part which I wish to read into the record and especially make the offer——

The Court: I suppose the pleading should be known as "Defendant's Exhibit M" in the case.

Mr. Dickson: Filed on the 16th day of November, and the paragraph referred to reads as follows:

"Defendant denies that the discovery vein or lode of the West End claim referred to in Paragraph V of said complaint is commonly called and known as the 'West End' vein or lode, but on the contrary alleges that it is commonly known as and referred to as the Tonopah-Extension-MacNamara-West-End-Jim Butler vein or lode, and defendant further alleges that the original discovery of rock in place bearing gold, silver, or other valuable metals upon said West End mining claim was made upon the said Tonopah Extension-MacNamara-West-End-Jim Butler vein or lode, and that said vein or lode was, at all times has been, and now is, the discovery
1128 and location and primary vein or lode of said West End mining claim. And defendant avers that there is no top or apex of said discovery vein within the limits of said West End Mining claim. That said so-called West End or Tonopah Extension-MacNamara-West End-Jim Butler vein is a deposit in the nature of a sheeted zone or belt of mineralized rock lying between two formations, and is found underneath the surface of mining claims adjoining and to the north of said West End mining claim, to wit the MacNamara, Tonopah Extension, and other claims. It also lies underneath the surface of the West End mining claim, as well as the properties of this defendant, to wit, the Eureka and Curtis mining claims, and also lies underneath the surface of many other claims in the Tonopah mining district. That said vein by reason of its form or structure has no apex, or if it has an apex, the same crossed the northerly and southerly boundaries of said West End mining claim, and does not cross either the easterly or westerly boundaries of said claim.

Mr. Lindley: As I said, your Honor can rule on that when you feel inclined to do so. I submit that the entire atmosphere and environment of the case is before the court and it can see if it becomes necessary or not.

And can rule if it becomes necessary to rule later on.

Mr. Dickson: It is marked "Defendant's Exhibit M."

Mr. Lindley: Now, Mr. Dickson, in reference to the future inspection of the property by the Court, I suggest that Mr. Wiley and Mr. Searls and the Court get together and fix that time.

1129 Mr. Dickson: That is quite agreeable to me.

Mr. Lindley: Is that agreeable to your Honor?

The Court: That is very satisfactory.

Mr. Dickson: We rest.

The Court: The case is continued until January 25th——

Mr. Lindley: May the record not state that the evidence in the case is closed and that we adjourn for argument until the 25th of January?

Mr. Dickson: It is understood on both sides that there will be no further evidence offered based upon any new work done by either side.

Mr. Lindley: There is another matter before adjourning, if your Honor please, that I would like to speak about. The status of the testimony in this case, that is, the transcriptions, the witnesses are endeavoring to straighten that matter out and going over and making such suggestions as to possible errors or omissions. Ordinarily, I understand the rule to be that the witnesses woould have to be called back on the stand to make those corrections. What are we going to do about it?

Mr. Dickson: We waive that, of course. Each side will furnish the other with a corrected copy.

Mr. Alling: May I suggest that each of the witnesses correcting his evidence endorse the fact that correction has been made by him upon the section or sections of the record in which the corrections occurred, and that the reporter be authorized, insofar as it is necessary, we furnishing him with all four copies, for that purpose, to make the corrections and thereafter transmit to each of us our corrected copies.

1130 The Court: In that connection, has any arrangement been made to furnish me a copy?

Mr. Dickson: Yes.

Mr. Lindley: Sure.

Mr. Dickson: After they are corrected, the original will be handed to the Court. I understand from somebody that Mr. Lozano said that he could do this much better by taking his notes and the transcripts to Reno and make the corrections for the original copy there.

Mr. Lindley: I have no objection to that. We all have our own copies from which we can marshal the evidence for the purposes of the argument. I think we understand the situation.

Mr. Dickson: I believe there will be no misunderstanding.

The Court: I think, Judge Lindley, you were going to speak with reference to closing the evidence, or not closing it.

Mr. Lindley: An order of the Court may be entered submitting the case so far as the testimony on both sides is concerned and on the issues under the stipulation. And that an adjournment now be had until the 25th of January for the purpose of hearing the argument.

Mr. Downer: The evidence will be closed except the inspection.

Mr. Lindley: We do not consider that evidence, although the

Supreme Court of California says it is; with that saving clause, that whatever the Court see is not to be considered as evidence.

Mr. Dickson: All the samples which were referred to this
1131 afternoon will be considered in evidence.

Mr. Lindley: Everything that has been referred to by any witness on either side is to be considered in evidence.

The Court: Enter the order, Mr. Clerk, that the evidence in the case is closed, with the exception of whatever status as evidence an inspection by the Court may have.

The case is continued until January 25th, at 10 A. M. for argument.

1132 In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

No. 2999.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Certificate of the Court Reporter.

I, Joseph Lozano, do hereby certify that pursuant to stipulation made and entered into between the above-entitled parties and their counsel, I acted as shorthand reporter of the above-entitled court and acted as such in the trial of the above-entitled cause; that the annexed and foregoing shorthand report of evidence, herein designated as Volume II., together with Volume I. herein, is a full, true and complete report of the evidence in the said cause, and contains, with the exhibits, records and documentary evidence therein referred to and identified, all the evidence offered, given or introduced in said cause by the respective parties upon the trial thereof; all of the objections and motions of the said parties thereto, or any part thereof; and all rulings of the court upon such objections and motions, and all exceptions to such rulings, had and taken during said trial.

Signed this — day of August, 1915.

——— ———.

1133 I, Mark R. Averill, do hereby certify that I am the Judge before whom the above-entitled cause was tried; that Joseph Lozano was, by stipulation of the parties, the shorthand reporter who reported said cause; that the annexed and foregoing shorthand report of evidence, designated as Volume II., together with Volume I. herein, duly certified by the said reporter, is the report of the evidence in said cause, and contains, with the records, exhibits and documentary evidence therein referred to and identified, all of the evidence offered, given or introduced in said cause by the respective parties upon the trial thereof; and all objections and motions of said parties thereto, or any part thereof; and all rulings of the court upon

such objections and motions, and all exceptions to such ruling, had and taken at said trial.

Dated: This 28th day of August, 1915.

MARK R. AVERILL,
District Judge.

1134–1136 In the Supreme Court of the State of Nevada.

No. 2195.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Appellant,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Respondent.

I, H. R. Mighels, Clerk of the Supreme Court of the State of Nevada, do hereby certify that the foregoing pages numbered from 511 to 1131 inclusive comprise volume 2 of the Record on Appeal in the above entitled cause, and that the same have been compared and is a true and correct copy of the original now on file in my office.

Given under my hand and seal of said Court, this seventh day of August, 1916.

[Seal Supreme Court, State of Nevada.]

H. R. MIGHELS,
Clerk Supreme Court of the State of Nevada.

[United States internal revenue documentary stamp. Series of 1914, ten cents. Cancelled 8/8/1916. H. R. M.]

* * * * * * *

1137 Copy.

In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Opinion.

The decision of this phase of this case in this court is not important upon the questions of law involved, and great responsibility does not rest upon the court in that respect, if it be assumed that the case will be appealed, which is probably not unlikely; but a very great responsibility is imposed upon this court as to its findings upon the questions of fact, which, unless much at variance with the evi-

dence as it appears in the transcript, will probably not be disturbed by any higher court. This then is the task undertaken, to be performed humbly and carefully and with the hope that the results reached may impress those who have no immediate interest in the outcome as rational and correct.

The all-important contention of fact is whether the body of quartz, ore etc., or the bodies of quartz, ore, etc., in controversy constitute one vein or two. The evidence easily preponderates that it, or they, form but one vein, which will be referred to generally hereinafter as the MacNamara-West End Vein. But, though thus found, to be one vein, this conclusion is not at all what might be called an absolute one, but is qualified, as will further appear in this discussion.

1138 During the taking of evidence and in the argument a tendency was occasionally vocally manifested by experts and counsel to view the situation from the standpoint of the miner. Nothing in the law or elsewhere demands of a skilled geologist or lawyer that he view anything as a prospector might or he who wields a shovel, but this tendency had at least the value of preventing these learned gentlemen from wandering too deeply into the often uncertain realms of speculative geology.

Before proceeding further the positive position must be adopted that things are to be taken as we find them now. Speculative geology will be resorted to, but only for the purpose of explaining the present situation, and without basing any final conclusion thereupon.

Four models were used at the trial, one of which, a skeleton model, offered by the West End, will be called the West End model. The corresponding skeleton model offered by the plaintiff company will be called the Butler model; and the other two, also offered by the plaintiff company, will be called the glass model and the block model respectively.

It will be necessary to refer to three surfaces of the earth over the territory where the vein in dispute now is, the present surface, which will be so called; the surface that existed just before the materials which form the present surface were deposited, which will be called the Trachyte Surface, and the surface which existed prior to the erosion which left the Trachyte Surface and immediately after the vein was formed, which will be called, for want of better name, the Original Surface. The most ancient of these was the Original Surface and the next the Trachyte Surface, with probably a long period of time, geologically speaking, between them. Prof. Lawson

1139 describes another surface, which followed the Midway Andesite flow, and which is of no value to this discussion, except that, in a greatly eroded condition it forms part of the present surface, that part overlying the northeast corner of the West End Claim, extending thence easterly and north-easterly.

References will be made in parentheses. These are all to the transcript of the evidence except as otherwise noted, the name given being in nearly every case that of the witness, but occasionally that of an attorney. The references are given only to statements that are conspicuously in point. Many more could have been given, running

into the hundreds, but their worth would be only by way of cumulation.

A pronounced contention of the plaintiff is that the Trachyte Surface formed a hill one of whose slopes faced the west; and that, as a result of erosion, the vein outcropped on that hillside along a northerly and southerly line; and that, assuming the Trachyte Surface to be that surface to which the apical facts should be referred and upon which the lines of the West End Claim should be considered to be imposed, rather than upon the present surface, the apex of the vein crosses the side-lines of the claim; and that, if the West End Claim possesses any extralateral rights, they are defined by the vertical planes of the side-lines projected easterly. This contention is without merit. The evidence easily preponderates that there never existed any such hill slope—that the vein had no such outcrop on the Trachyte Surface, but that its termination, as that now exists in the westerly portion of the West End Claim, is the result of the eruption of the volcanic neck known as Mt. Brougher, during which
1140 the vein was blown out of existence beyond the line westerly and southerly of where it is now found in the western workings. (Winchell, 1113, 1114, 1115, 1119.) Before that outburst the vein extended onward under the Trachyte Surface, outcropping only as hereinafter described. (This opinion, 16.) All the testimony upon which this contention of an ancient hillside with an outcrop upon it rested was explained away in the rebuttal. (Wiley, 1094, 1090, 1103.)

The plaintiff company rests its case to a great extent upon its claim that the vein is an anticline. That the vein is an anticline, using the word broadly and generally, is true; but strictly speaking it is not true either geometrically or geologically. The difference, however, is merely one of wording of definitions, and is not important. The word "anticline" will serve as a name for the vein-form if properly limited and if no conclusion is drawn from the use of the word that is not justified by its application here. The word "anticline," geometrically speaking, implies the existence of one or two "synclines" or "troughs" lying laterally with it and having the same direction. Nothing of this kind is shown by the evidence in this case; no synclines accompany the anticline. (Lindley on Mines, Section 312.)

At this point an occasion offers to suggest a danger. Whatever result may be reached in this case, it must be based upon an incomplete presentation of evidence. Should it develop in the later mining history of the Tonopah District that the conclusions of fact in this case are wrong, the error should be excused for this reason.
1141 The geology of this case is confined to a limited area consisting of the West End, MacNamara, and MacNamara Extension Claims, a considerable part of the Curtis and Eureka Claims, and a very small portion of the Valley View and California Claims, covering an area of less than a tenth of a square mile, though it is apparent that the vein has a much greater sweep and that certain geological features of the controversy involve a large part of the developed portion of the Tonopah District. One of the witnesses for the West End upon being asked how many veins in the West End

Claim named, among others, the Lower Contact Vein, but no evidence was given descriptive of it or of its relation to the West End MacNamara Vein, yet in one of the arguments is found this significant language: "* * * The Lower Contact Vein, which is not involved here, but exists, as has been testified here in evidence, where probably a similar condition exists * * *." (Lindley's Argument 30.) Several other veins were referred to. (Searls, 985.) It may be that every vein named during the trial bears a geological relation to the vein in controversy, and, as the Court is left by the evidence with the MacNamara-West End Vein dipping downward to the north beyond the MacNamara, it is left with the suggestion that development on that side shows something of the geological relation of this vein with others, especially as one attorney used the expression "under many other claims." (Lindley, 1128.) The Siebert Fault gets its name in this case from a fault of that name in the territory of the Tonopah Company, but no correlation of the two was demonstrated. The testimony in the case is voluminous, occupying 1130 pages of transcript, yet it is plain to be seen that it could have been much more extensive. All this is mentioned here as
1142 cautionary and as indicating how helpless we are in facing great geological problems.

Whether the word "anticline" is applicable here or not, the word "anticlinal" has a broader meaning and is more applicable. It is defined: "Inclining or dipping in opposite directions." "Anticlinal axis" is defined: "A line from which strata dip in opposite directions, as from the ridge of a roof." The MacNamara-West End Vein is anticlinal, using the word liberally; and, if so, it has presumably, an anticlinal axis. As a proposition of law the plaintiff company holds that if this is true, there can be no extralateral rights, because there is no true apex, as the existence of an apex involves the existence of a terminal edge; that there can be no terminal edge if the vein goes up one slope, turns over, and goes down the other. This feature of the case is so momentous that it must be decided as a question of fact first to what extent an anticlinal axis actually exists.

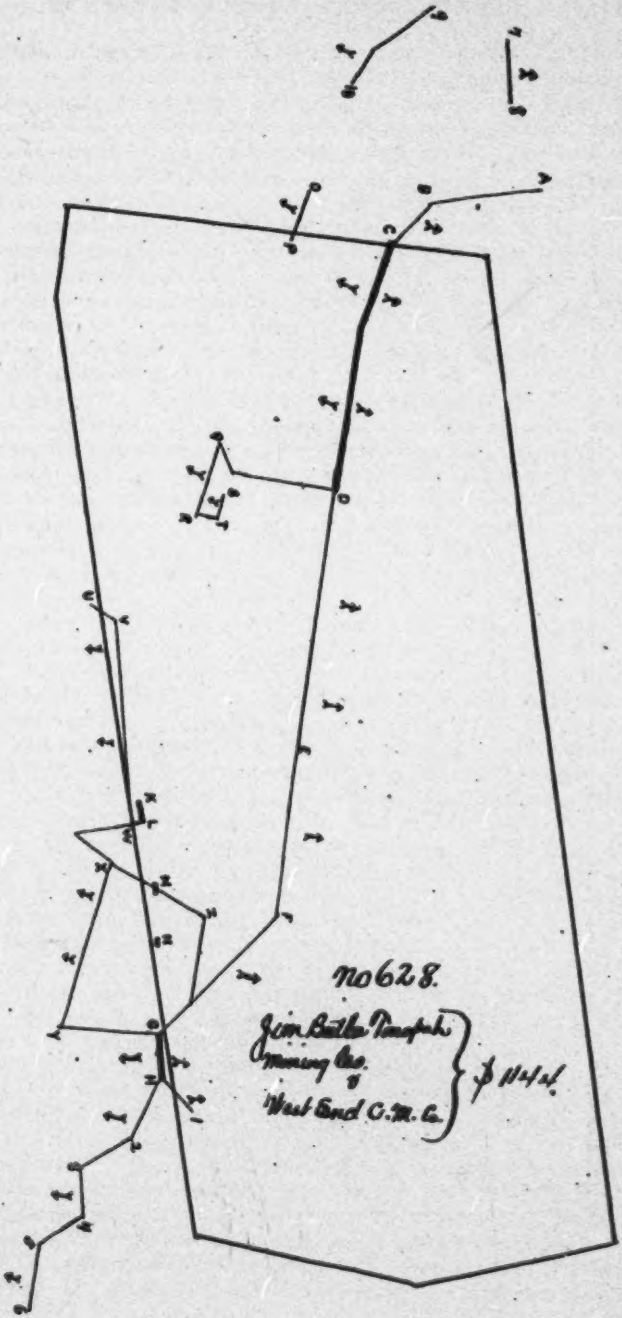
The West End model, upon a scale of "one inch equals forty feet," shows the vein for a length of 2000 feet. In this length is 560 feet of anticlinal axis, and 1440 feet showing no union of the slopes of the vein. In other words a united crest of the vein exists for 560 feet in a length of 2000 feet, or for a little over one fourth of the whole, or 28%. The vein continues on about one hundred feet farther into the California than is shown on this model. (Finch, 651, 689; Siebert, 746.) This reduces the percentage of axis to 27%; and if it continues on farther westerly the percentage of actual axis is correspondingly lowered.

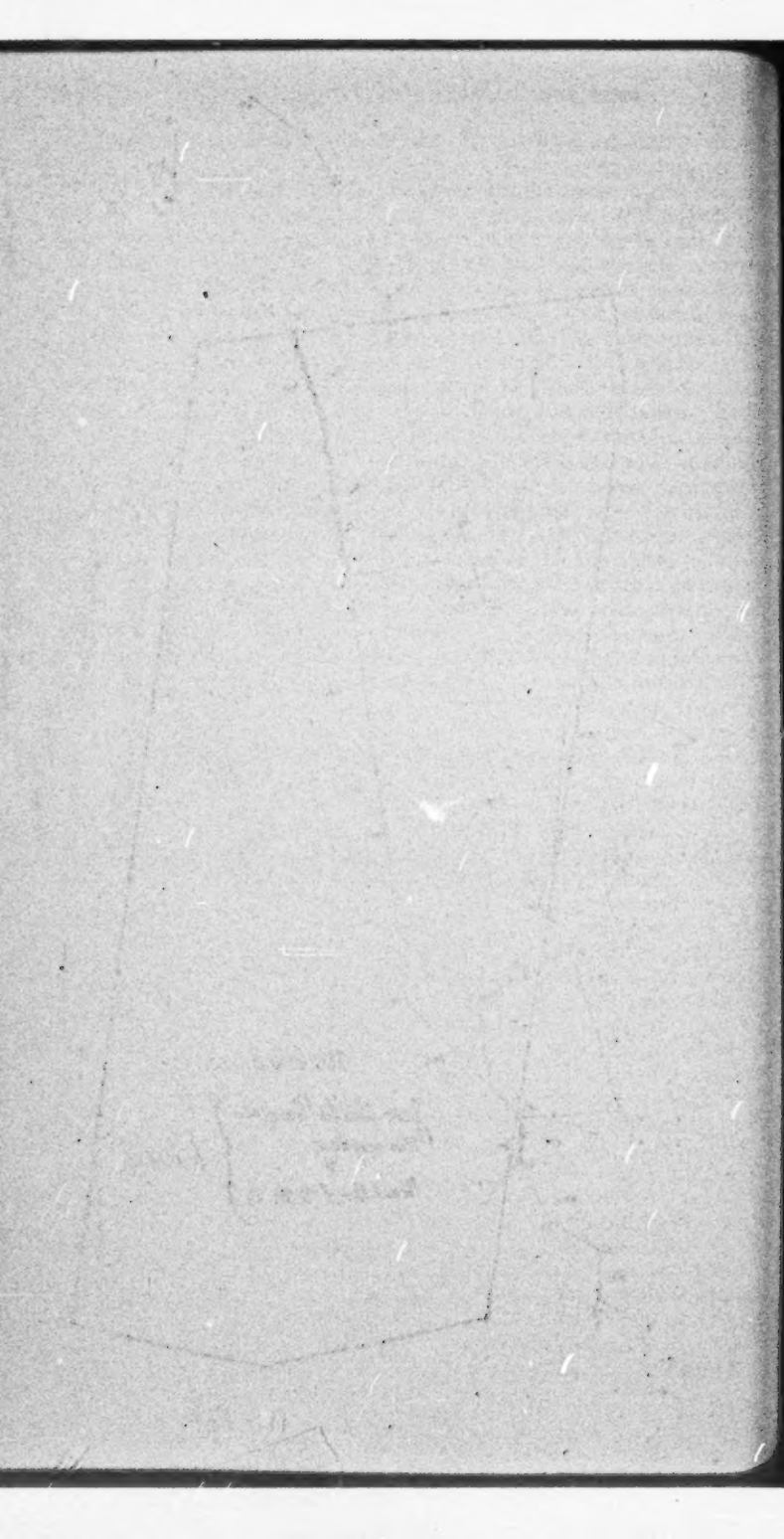
The Butler model upon the same scale shows the vein for
1143 a length of 1760 feet, in which distance 640 feet of united crest is shown, or rather assumed to be shown, and 1120 feet is apparently open. The axis, according to this model, is 36.4% of the length of the vein; but this model includes very little of the vein in the ground of the Tonopah Company. The Butler large map, Ex-

hibit 1, shows a united crest of 600 feet in a length of 1800 feet, or 33.3%.

Hereafter in this discussion a diagram marke[illegible]page 8 will be referred to. It is not drawn to scale and is a little out of proportion in places, but is accurate enough to serve the purpose for which it is used. It is based upon the West End model, because that model shows a united crest of the vein in one more place than does the Butler model. The lines shown on the diagram are, with the exception of a few whose meaning is evident; those joining points on the highest parts of the slopes of the vein. The line ABCDEFGH is a continuous "high" line approximately 1440 feet long, all but 480 feet on the south slope and all but about 430 feet in the West End Claim. The line CDEFG, a part of the above line, is a continuous "high" line about 1100 feet long, all in the West End Claim, and all on the south slope except 360 feet, which is the anticlinal axis part of this line in that claim. The lines ST, UVW, and XY are lines on the northern slope joining the highest points of the vein on that slope, and are not far from parallel to the "high" line CDEFG on the opposite slope; they contain no part of the anticlinal axis. The line H-6 is also on the north slope, continuing the line CDEFG to the west, and containing no part of the axis. The line 7-8 may safely be considered as a continuation of the long south slope line to the east, and is not a crest line.

[Here follows diagram marked page 1144.]


No 628.
Jim Butler Tonopah Mining Co. of West End C. M. Co.
N 1/2



1145 The lines OP and 9-10 are apparently on the north slope and fairly parallel to the line 7-8-BCD, but they are probably no part of the West End-MacNamara Vein. (Searls, 967, 969.)

Between VW on the north slope and DEF on the south slope, there is a union of the two slopes of the vein at KL for 40 feet, a liberal estimate, though one of the witnesses for the Butler gives the distance as 120 feet. Between the line XY on the north slope and FG on the south slope, there appears to be a union of the vein slopes at M for twenty feet, another liberal estimate. Between these two lines, there is also at N, as shown by the West End model, a detached portion of the vein not connected by workings on the vein with any other portion of it but higher than either FG or XY. The three lines KL, M, and N probably represent fragments of an anticlinal axis that once existed.

Before proceeding farther it must be noted that the models are "negatives,"—that in general what appears on them as solid represents space underground, stopes, drifts, crosscuts, winzes and raises, and that what appears upon them as space represents solid rock in the larger areas and pillars in the stopes, which condition adds a good deal of difficulty to the making of estimates and the measurements of lines, especially in the area containing the lines KL, M and N. No doubt the vein quartz extends above the "high" lines described above, and no doubt the vein quartz extends east and west of points where the vein shows in drifts, crosscuts, winzes and raises. All this presents no serious difficulty, however, except in the vicinity of KL, M and N. The lines on the diagram are drawn as straight lines between the pairs of points, and of course are only approxima-
1146 tions; but they are reasonably close to the truth.

Between the lines 7-8 and 9-10 is no sign of an anticlinal axis. The vein workings represented by them are much higher in elevation than what appear to be the corresponding workings west of them because of the influence of the Buried Fault, which passes between the points 8 and A on the south slope and 10 and O on the north slope. The Edwards Fault, whose effects are the most extensive of any of the faults that occurred in the area under discussion, passes between the points R and V on the north slope. It destroyed the vein between these points, but on the south slope its action was not sufficient to break the continuity of the vein along the line DEF, though it depressed the vein and contributed to its non-existence above the 400 level to any considerable extent between D and E, this effect extending westerly probably to F and Z.

During the argument a certain word was given unusual prominence, the word "obvious," in contrast with which, its newly coined antonym "subvious" demanded marked attention. (Alling's argument, 141; Lindley's argument, 34, 84.) "Obvious" is a good word.

The discussion of the lines of the diagram brings out something obvious. In the western territory it is obvious that the line H-6 is an apex. Its length was not clearly shown by the evidence, but it is more than 600 feet. From it as a terminal edge the vein dips to the north. It is equally obvious in the eastern territory that the lines 9-10 and O-P are apices, whether the workings they represent are a

part of the MacNamara-West End vein or not. If not, it is obvious that the lines 7-8 and BC are apices; and if so, they are still apices, controlling 360 feet of the vein, from which the vein
1147 dips to the south. It is obvious that the line DE represents an apex, from which the vein dips to the south; and it is obvious that ST is an apex from which the vein dips to the north. It is obvious that EF and FG are apices, except as interfered with by the lines KL, M and N; and that VW and XY represent apices except as interfered with by the same lines. From E and FG the vein dips south, and from VW and XY the vein dips north. The only "subvious" place is the region between EFG on the south and VWXY on the north, extending from K to G. On the Butler model this region is 520 feet long, of which all but 120 feet along where the crest line is supposed to be is space, that is, rock, the 120 feet being represented by the line KL. On the West End model this region is 440 feet long, of which 100 feet appears to be along the crest line, in three parts, 40 feet, 20 feet, and 20 feet long respectively, represented by the lines KL, M and N, one of which, N, is a doubtful piece. On the Butler map, Exhibit 1, this region is shown as 520 feet long, containing two crest connections, one at KL and one at N. It looks as though some one or more had taken it for granted that a crest line exists through this region for 520 feet or more, which brings out a curiously contradictory state of affairs, the West End people being willing to find the point at which the crest line crosses their north side-line in this region at a point 1142½ feet from their north-east corner and "in space." (Richardson, 47.) And yet they put up none of their famous "A Raises" in that region. The Butler people, to whom the anticlinal axis is vital, though they did considerable work in West End territory, left 520 feet of that axis in a
1148 very doubtful condition. One of the counsel for the plaintiff terms it "Terra incognita," in which, however, he includes the space from G to D, 760 feet in length down the supposed slope of the anticlinal axis. (Lindley's argument, 39.) Why was not exploration done in this "Unexplored country"? The answer is obvious; the burden rests upon the defendant to show an apex through doubtful territory. (Lindley's argument, 40.) Yet the same counsel says that his figure 147 represents the Butler contention. (Lindley's argument, 30.) Figure 147 is a colored picture of the Butler block model, of which something will be said later.

To sum up at this point, it may be said that on the south slope of the vein apices exist at 7-8, BC, DE, and H-1, that an anticlinal axis exists along CD and GH, and that an apparent apex along EFG is thrown into doubt by the unexplored condition from K to G. In West End territory are to be found 360 feet of anticlinal axis, 200 feet of apex, and 480 feet of apparent apex thrown into doubt by the unexplored condition from K to G, all on the south slope toward the Butler side-line except the 360 feet of axis.

Why devote so much attention to the lines described, as no issue of this kind was made by either side, the West End claiming its apex in the immediate vicinity of the anticlinal axis and the Butler claiming the non-existence of an apex in the same vicinity, but instead

thereof the crest of a roll? In other words, why go out of the issues as made during the progress of the case? The answer is composed of several reasons: 1. The discussion is within the issues as made by the pleadings. 2. Because the condition is an obvious one;
1149 3. Because the evidence introduced by both sides shows the condition described; 4. Because the condition described might have been the basis of a compromise; 5. Because the condition described tends to strengthen the position hereafter to be taken; 6. Because it correlates so well with one of the arguments in the case; (Dickson's argument, 30 et seq.) 7. Because it has an important bearing on the block model; 8. Because it gives this case a peculiar status of its own, bringing it somewhat into the ordinary apex class; 9. Because it casts upon the anticlinal axis the conception of a common apex, rather than merely the crest line of a roll.

The Butler Company offered a model in evidence generally referred to as the block model, which as noted above, has been said to represent its contention. As an exhibit this model is open to objection. It shows the present surface, consisting of Fraction Dacite Breccia to the west and south and Midway Andesite to the north-east. By removing the block representing the Breccia the Trachyte Surface is uncovered in the western part of the claim and the Midway Andesite surface in the north-eastern corner. By removing two more blocks representing the Midway Andesite above and the Mizpah Trachyte below, the vein itself is uncovered. All this is ingenious as well as artistic and of value as hereafter noted, but the vein is represented as a continuous sheet from a north-and-south vertical plane east of the West End Claim to a similar parallel plane west of it. (Lindley's argument, 134.) Mr. Lindley states in several places in his argument that the defendant company admits the continuity of the vein from the alleged apex to the ore bodies in dispute.
1150 (Lindley's argument, 8.) An admission of this kind was made, but it meant that one could start in the western ore-body in dispute and go up in the vein to the crest, and likewise from the eastern ore-body in dispute. It can mean no more, because the evidence will not permit a broader interpretation. (Finch, 671.) The vein does not exist in one unbroken sheet as depicted on the model, not, at any rate, as shown by present development. If, therefore, the Butler contention rests upon this model, it rests upon a foundation consisting largely of assumption, which, however, might have been turned into fact in part by proper development of the "Terra incognita." But as representing the Trachyte Surface the model has some value, especially in the western area. Such a surface must have existed; and in all likelihood the vein was exposed on this surface, using here the word "vein" in its broadest sense.

The evidence will show, especially that of the plaintiff, that its witnesses and attorneys used two conceptions of what the vein is. When the miners engaged in development work were told to follow the vein, and did so, it meant the solid quartz, with perhaps a showing of ore; but the witnesses, some of them, were quite positive that the vein includes much more than this. (Finch, 650; Searls, 981; Section Map G, Searls' 4.) The witnesses Finch and Searls and some

others include within their conception of the vein the "halo," or "stringer zone" or "streamer zone," which is no doubt geologically correct.

The defendant company claims two apices along the anticlinal axis, one for the north-dipping vein and one for the south-
1151 dipping vein. The latter vein, according to this theory apexes along the line where it abuts against the north-dipping vein, while the former apexes along an irregular line above the other vein as indicated by the quartz exposures in the "A Raises." The finding has already been made that there is but one vein, which, having disposed of the two-vein theory, now requires a consideration of what the "A Raises" do show. The plaintiff's witnesses admit the presence of bodies of quartz in these raises, some of the bodies of good size and considerable length; but they include them in the "Stringer Zone" of the vein, or its "Halo." Some of these are large, from three to five feet in thickness, which, were it not for inescapable comparison with the immense quartz bodies in the MacNamara-West End Vein itself, would never be termed "stringers." The larger ones are probably not stringers, geologically or otherwise; they are not part of the "Stringer Zone," but are part of the "Halo," the distinction being readily grasped; that is to say, they constitute an upward extension of the main vein toward the surface.

They follow to some extent, though not very closely, a gouge hanging wall, which the West End people assert is the hanging wall of the north-dipping vein, but which the Butler people ascribe to the Siebert Fault. This interesting and evidentially conspicuous phenomenon received some rather strong jolts on the rebuttal (Wiley, 1100; Winchell, 1119); but hardly enough to jolt it out of the case. That it exists, or something of the kind exists, was proven. It is probably a group of faults, rather than one great fault, easily correlatable with a great fault in the Tonopah Company's territory.
1152 One distinguished witness called it eccentric and said it was subject to undulations. (Lawson, 1031, 1060.) It had the effect of shearing the "halo" on the north side and of lowering the Mizpah Trachyte surface on that side, at least in the vicinity of the anticlinal axis, from which it may safely be inferred that the "halo" was once in a much more regular condition than at present, much less broken and crushed, and much more extensive. As the Mizpah Trachyte Surface exists now, the halo reaches it. This is illustrated on West End cross sections B, G and D, and by the Section Maps corresponding to glass sections 1, 3 and 4; and is strongly suggested by all the other Section Maps corresponding to the glass sections, which show the trachyte over the vein to be very thin. As the Mizpah Trachyte Surface existed before affected by the faults, the quartz of the halo reached it, because the halo must have been more extensive then than now and must have been carried down on the north with the trachyte. Therefore, if the vein is referable to the present Mizpah Trachyte Surface, it has outcrops of quartz on that surface; if referable to the Mizpah Trachyte surface before the faulting, it had outcrops of quartz on that surface. The models and section maps indicate very strongly that the halo reached the Original Sur-

face. The evidence is conclusive that when the fissures were formed in which, or associated with which, the vein is found, intense shattering occurred along the anticlinal axis, especially under the crest. Whatever caused the formation of the fissures, its action was far-reaching enough to create sub-parallel fissures. (Lawson, 1000.)

There are evidences of three of these in this case, and perhaps
1153 more, two of which attain to the dignity of veins, and they are workable veins, that is, they contain ore of commercial value. One of them, the Fraction Vein, is important enough to be a bone of contention in another suit. Its crevice was undoubtedly a channel of circulation that reached the surface, through which channl the "ascending magmatic emanations" sought escape. The same may be said of the South Vein. It is a striking fact that both these branch veins rise on their dip into an area which would include also the quartz bodies in the "A Raises," unless they crossed each other, which is very improbable. This area may be assumed to lie on the original surface, and was a venting ground of this great vein and its branches. But are the veins in the "A Raises" comparable with the Fraction Vein? They are of good size, some of them probably as thick as the Fraction Vein in parts of its course. They contain ore. (Bradley, 316, 331, 338.) They are respectable and probably were more so before the playful Siebert Fault came their way. The quartz in them is not oxidized, which fact might argue against their having reached a surface; but half a dozen explanations can be offered against any such conclusion, one of which is that unoxidized veins are often found that undoubtedly reached a surface when forming, perhaps some in the Tonopah District. Before leaving this phase of the case, attention should be called to what lies east of the line "S-S" on Defendant's Exhibit D. (Searls, 979.) This is a map of the 400 level of the West End, just under which it is claimed the toe of the anticline is to be found; and everything east of the line "S-S," the toe-line, is in the halo, which, scaled
1154 on the map, is found to extend away from the main vein easterly about two hundred feet, and above it, and scaled on the model, 100 feet. This indicates the strength and continuity of the halo quartz where the Siebert Fault's influence was not great; and what the extent of the halo quartz was before it was sheared and crushed by the fault.

If the halo is to be included in the vein, and geologically it should be, this vein then reaches now and did reach all the surfaces to which the apical facts are referable. It has, therefore, along its crest and extending above the anticlinal axis of the united main quartz bodies, a condition of things that may well serve as a terminal edge under the many peculiar circumstances and facts of the case. And let it be kept in mind here that this sort of geological terminal edge need be applied at the very most only to the 360 feet of it extending west from the easterly end-line of the West End Claim as against the remainder of its length in that claim, said in the answer to be 1175 feet; and in all it need be applied to only 560 feet of crest line in a total length of 2000 feet, or more strictly speaking, to only 480 feet of crest line, for the remaining crest line or anticlinal

axis seems to be assumed by both sides, which the halo may as safely be assumed to accompany, both assumptions operating together, the habit of the vein in the assumed territory being reasonably inferable from its habit in known territory and under known conditions.

Two more questions of fact should be disposed of.

1155 It was very strongly urged on behalf of the plaintiff company that this vein has a rolling habit. Section G is offered as rather conclusive on this point. This section is open to criticism, not as to its correctness, but as to its location. It is taken across that part of the vein where the dip is the slightest, or very nearly the slightest, and where the north slope is largely absent, for which reason it is hardly a fair illustration of the habit of the whole vein, as it gives less prominence to the great ridge the vein itself exemplifies than it should. The vein is very irregular in size and very much distorted and broken, but it is almost free of rolls, having only two worthy of notice, one easily accounted for as a phenomenon of junction with the Fraction Vein and the other as a result of a number of small faults lying close together.

Much time and attention was given to the question of strike. As a matter of common sense rather than technical mathematics the strike of the vein as a whole is easterly and westerly, and the strike of its two slopes, assumed for the purpose to be separate veins, is as claimed by the West End. Its so-called mathematical strike is rather uncertain, depending on how far into the California the selected northerly point is taken; and if the vein may be assumed to be extending westerly in that claim of in the Extension ground, which some of the witnesses strongly hinted, even the mathematical strike may be swung well into an easterly and westerly approach to parallelism with the general strike claimed by the West End people. (Juessen, 203; Chandler, 258, 259; Searls, 983.)

Now the questions of law. Can a vein have extra-lateral

1156 rights in two opposite directions? Or to express it more carefully, can extralateral rights extend downward from an anticlinal axis or common apex of a vein in a given claim beyond both side-lines of the claim? The answer depends upon the peculiar facts of the case; and in this instance, because of those peculiar facts, the vein, though one, being practically more two than one, they can; or, treating it as one vein for both theoretical and practical purposes, a condition exists along its crest or axis which gives to the vein, considered broadly and as a whole, a terminal edge at the summit or highest point or line of highest points where the vein reaches most closely to the surface, making that line of highest points a true apex for the whole vein, from which apex the vein can be followed downward both northerly and southerly.

Can a secondary vein have a southerly extending extralateral right, if the primary vein, or discovery vein, has its extralateral right extending northerly? Counsel for the Butler Company holds that, under the two-vein theory of this case, no extralateral right to the south can be exercised, because the extralateral right predicated on the discovery vein flows to the north. (Lindley's argu-

ment, 158.) This contention is fully and conclusively answered by counsel for the West End. (Dickson's argument, 14 et seq.; Alling's argument, 160 et seq.)

Is the West End Claim entitled to any extralateral rights, its west end-line being a broken line? The rule probably is that for extralateral rights to flow from a mining claim, it must have unbroken and parallel end-lines, if the vein crosses the end-lines; or it must have unbroken and parallel side-lines if the vein
1157 crosses its side-lines. In this case the vein passes through the east end-line, which is unbroken, and passes out through the north side-line, having its length in the claim along and gradually approaching the side-line, which eliminates the side-line as a bounding line from which a limiting vertical plane might be dropped. The end-line being unquestionably the line from which the easterly limiting plane should be dropped and being unbroken, and the opposite limiting plane being necessarily parallel to it and fixed by the vein-crossing point on the side-line, it seems as though practically the west end-line has nothing to do with any extralateral right that may flow from the claim. However, the locator's contract with the government includes four covenants on the part of the locator, that he make a discovery of mineral in place, that he give notice of his claim, that he define his boundaries, and that his boundary lines conform to the requirements of the law, that is, they must be parallel and unbroken. If he observes these, the government not only gives him the land enclosed in his lines but the extralateral right. A strict application of this idea would bar the West End Claim from any extralateral right; but the law as applied by the courts is not so strict. (Shamel on Mining Law, 210; Lindley on Mines, Section 591, as controlled by reasoning in Section 582; Dickson's argument, 61 et seq.) Treating a part of the westerly end-line as converging, it has no application to the present facts of the case, as it passes west of all ore-bodies in dispute.

If the conclusion reached herein seems revolutionary, that from the apex or apices of one vein extralateral rights flow
1158–1163 downward across both of its side-lines, attention should be given to the words of former Chief Justice Beatty of Nevada:

"We are willing to admit that cases may arise to which it will be difficult to apply the law; but this only proves that such cases escaped the foresight of congress, or, that although they foresaw the possibility of such cases occurring, they considered the possibility so remote as not to afford a reason for departing from the simplicity of the plan they chose to adopt."

It is easy to realize that the condition described in this opinion is one that escaped the foresight of congress and is also exceedingly remote from the simplicity of the plan they chose to adopt; yet the law must be applied to it, the law in which congress used the expression "exclusive right of possession and enjoyment * * * of all veins, lodes, and ledges throughout their entire depth, the top or apex of which lies inside of such surface lines extended

downward vertically, although such veins, lodes or ledges *any* so far depart from the perpendicular in their course downward as to extend outside the vertical side-lines. * * * Note the plural of the word "side-lines."

This branch of the case is decided in favor of the defendant corporation. That is to say, the West End Consolidated Mining Company is the owner of the ore-bodies in dispute.

(Signed) MARK R. AVERILL,
District Judge.

Submitted March 31, 1915. Decided April 30, 1915. H. N., 293—'14. 2881 F2.

Endorsed: Filed Apr. 30, 1915. Robert G. Pohl, Clerk, by Lowell Daniels, Deputy.

Compared and Certified to as a true Copy.
H. R. MIGHELS,
Clerk Supreme Court, Nevada.

* * * * * * *

1164 In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Findings of Fact and Conclusions of Law.

This cause, having been called regularly for trial on the 8th day of December, 1914, before the Court (a jury trial having been expressly waived, as appears from the minutes of this court); and Curtis H. Lindley, Esq., Hugh H. Brown, Esq., W. E. Colby, Esq., and J. H. Evans, Esq., appearing as attorneys for the plaintiff, and Peck, Bunker & Cole, Horatio Alling, Esq., Cheney, Downer, Price & Hawkins, Dickson, Ellis, Ellis & Schulder, and H. H. Atkinson, Esq., appearing for defendant; and the trial being proceeded with and concluded under and pursuant to a certain stipulation entered into between the respective parties, which said stipulation is as follows, to wit:

1165 In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

No. 2999.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Stipulation.

It is stipulated and agreed between the parties hereto as follows:

I.

That the motion of Plaintiff heretofore made to file an amendment to its complaint, amending Paragraph VII of said complaint and Paragraph 3 of the Prayer of said complaint may be granted and said amendments or an engrossed amended complaint embodying said amendments may be filed as of the date of this stipulation:—that the Answer of the Defendant to the original complaint shall be deemed and taken as the Answer to the amended complaint and the replication heretofore filed shall stand as a replication to said Answer; subject to all rights of amendments by permission of the Court.

II.

The title, ownership and right of possession to the ore bodies in dispute shall be first tried and determined by the Court before Plaintiff shall be called upon to introduce evidence as to the tonnage and value of ore extracted by defendant. The issues raised by said amended complaint, answer and replication shall be tried in the following order:

As by said pleadings it is admitted that Defendant has been carrying on mining operations and extracting ore from underneath the surface of the Eureka and Curtis mining Claims, owned by the Plaintiff, the Defendant shall proceed to introduce its testimony justifying its rights to so mine and extract said ores. Plaintiff shall thereupon introduce its testimony in opposition to Defendant's and Defendant shall thereupon rebut the same. After the evidence has been fully taken in behalf of both parties on the issue as to title, ownership and right of possession, and argument thereon had, such issue shall thereupon be submitted to the Court for its finding and decision.

1166 III.

In the event that the Court finds in favor of plaintiff on the issue of title, the question of the tonnage and value of the ores claimed to have been extracted by Defendant from underneath

the surface of Plaintiff's mining claims and all other matters pertinent to that issue shall be brought on for hearing and trial by the Court by either party on five days' notice one to the other. Plaintiff first introducing testimony, Defendant to follow, and Plaintiff to close with its rebuttal. In determining the tonnage and value there shall be included all such ores extracted and removed by Defendant underneath the surface of Plaintiff's mining claims prior to the commencement of this action, as may by the Court be determined to have been the property of Plaintiff, and shall also include all ore extracted and removed by Defendant from such property since the commencement of this action, which shall be adjudged to be the property of Plaintiff, and up to and including the date of the trial of such issue of tonnage and value, findings of fact and conclusions of law, embracing all the issues in the case, shall be signed and filed, and judgment therein shall be entered.

IV.

In the event said Court shall determine said issue of title in favor of Defendant, findings of fact and conclusions of law shall be filed and judgment therein entered.

V.

Nothing in this stipulation contained shall be construed as a waiver on the part of either party of their respective rights to move to vacate or set aside any judgment which may be entered in this action, or the findings and conclusions of law made by the Court; or to apply for a new trial, or to appeal from said judgment or to take any steps in regard thereto as the respective parties may be advised.

VI.

Upon demand made in that behalf by Plaintiff, at any time subsequent to the announcement by the Court of its Decision on the issue of title, if such decision be in favor of Plaintiff, the Defendant will permit Plaintiff, its attorneys and an assistant to be nominated by Plaintiff, to inspect and take copies of all entries in the books of Defendant, relating to the tonnage and value of said ores, and to inspect and take copies of all assay sheets, memoranda of assays, maps, and other data, showing or tending to show the tonnage and value of said ores; and to give to said Plaintiff all information Defendant, its officers, and employees have in reference to said tonnage and values.

1167 VII.

In the event that said Court shall determine the issue of title in favor of said Plaintiff, and upon its announce- of such determination, the Court shall forthwith issue and set for hearing an order to show cause herein upon the application for a restraining order and

injunction filed herein by Plaintiff on the second day of December, 1914.

Dated at Tonopah, Nevada, December 7th, 1914.

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HUGH H. BROWN,
W. E. COLBY,
J. H. EVANS,
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PECK, BUNKER & COLE,
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DICKSON, ELLIS, ELLIS & SCHUDLER,
H. H. ATKINSON,
Attorneys for Defendant.

(Endorsed:) Filed Dec. 7, 1914. Robert G. Pohl, Clerk, by Lowell Daniels, Deputy.

And the Court having heard the proofs of the respective parties and considered the same, and the records and papers in the cause, and the arguments of the respective attorneys thereon, and the cause having been submitted to the Court for its decision, the Court now finds the following facts:

1168 *Findings of Fact.*

I.

That the Plaintiff, Jim Butler Tonopah Mining Company, at all of the times mentioned in the Complaint and the Amended Complaint herein, was, and is now, the owner and in possession of, and entitled to the possession of those certain patented lode mining claims situated, lying and being in the Tonopath Mining District, County of Nye, State of Nevada, known as and called respectively the Eureka lode mining claim and the Curtis lode mining claim; the said Eureka lode mining claim being a portion of United States Survey designated by the United States Surveyor General of the State of Nevada as Survey No. 2600; and the said Curtis lode mining claim being a portion of United States Survey designated by the United States Surveyor General of the State of Nevada as survey No. 2042.

II.

That the defendant, West End Consolidated Mining Company, is and it or its predecessors in interest continuously for more than thirteen years last past has been, the owner of, in possession of, and entitled to the possession of that certain lode mining claim situated in the Tonopah Mining District, Nye County, State of Nevada, known as and called the West End lode mining claim, being United States Survey designated by the United States Surveyor General for the State of Nevada as Survey No. 2024; that the Government of the

United States, by patent bearing date the 21st day of July, 1904, granted and conveyed said West End mining claim to the defendant's grantor and predecessor in interest, namely, the Tonopah Extension Milling & Mining Company, a corporation; that said mining claim is described in said patent as follows, to wit:

1169 Beginning at Corner No. 1, from which the south corner of Section 35 in Township 3 North of Range 42 Mount Diablo Meridian bears South 2 deg. 12 min. West 1248.6 feet distant.

Thence, first course, south 74 deg. 42 min. West 750 feet to Corner No. 2; 1406.8 feet to Corner No. 3.

Thence, second course, North 11 deg. 20 min. W. 301 feet to Corner No. 4.

Thence, third course, North 5 deg. 31 min. East 313.3 feet to Corner No. 5.

Thence, fourth course, North 74 deg. 6 min. East 749.9 feet to Corner No. 6.

Thence, fifth course, North 74 deg. 42 min. East 608 feet to Corner No. 7.

Thence, sixth course, South 83 deg. 58 min. East 134.5 feet to Corner No. 8.

Thence, seventh course, South 5 deg. 31 min. West 269.8 feet to a point from which discovery shaft bears South 74 deg. 42 min. West 204.5 feet; 590.7 feet to Corner No. 1, the place of beginning.

That prior to the issuance of said patent a valid discovery was made upon and within said West End Mining Claim, and a vein or lode of rock in place, bearing gold, silver, and other valuable metals was cut by and disclosed in the discovery shaft of said mining claim; that said vein or lode so cut and disclosed in said discovery shaft, at its top or apex, and on its course or strike, crosses the easterly end line of said West End mining claim, and thence, at its top or apex and on its course or strike, continues in a westerly direction within said mining claim, and between the side lines thereof, until it intersects, and at its top or apex and on its course or strike, crosses the northerly side line of said mining claim and so departs therefrom.

III.

That said Eureka lode mining claim adjoins and is contiguous to said West End mining claim upon and along the southerly side line of said West End mining claim, and that said Curtis lode

1170 mining claim adjoins and is contiguous to said Eureka lode mining claim upon and along the southerly side line of said Eureka lode mining claim.

IV.

That there is a vein or lode of rock in place, bearing gold, silver, and other valuable metals, which, at its top or apex, and on its course or strike, crosses the easterly end line of said West End mining claim 130 to 140 feet northerly from the southeasterly corner of said mining claim, and thence, at its top or apex, and on its course or

strike, continues westerly in said mining claim between the side lines thereof to a point on the northerly side line of said claim 1142½ feet westerly from the northeast corner of said claim measured along the northerly side line thereof, at which point the said vein, at its top or apex, and on its course or strike, departs from said mining claim, crossing said northerly side line. That said vein dips southerly, and in its downward course so far departs from the perpendicular as to pass beyond the southerly side line of said West End mining claim, extended downward vertically, and thence into and beneath the surface of the said Eureka lode mining claim and the said Curtis lode mining claim of the plaintiff company.

That the defendant is now, and at all of the times mentioned in the complaint and the Amended Complaint herein, was, the owner of, in possession of, and entitled to the possession of said vein in this finding mentioned and described throughout its entire depth between vertical planes, one drawn through the easterly end line of said West End mining claim continued in its own direction indefinitely southerly, and another drawn parallel thereto through a point on the northerly side line of said mining claim 1142½ feet westerly from the northeast corner of said mining claim, measured
1171 along the northerly side line thereof, continued indefinitely in its own direction southerly.

The said vein is more particularly described as follows:

The said vein does not on its upward course, or at its top or apex, outcrop or reach the present surface, but is covered or buried to a considerable depth by lava, locally known as and called "Midway" andesite, which, after the formation of the vein, flowed over the then surface of the territory in which the vein exists; that at and for a distance of 360 feet westerly from where said vein or lode crosses the easterly end line of said West End claim, which crossing is at a distance of 135 feet northerly from the southeast corner of said West End claim, there is a juncture or union between two limbs or sides of said vein, and from the summit of said juncture or union the downward course of one limb or side thereof is in a northerly direction, and the downward course of the other limb or side thereof is in a southerly direction; that there is a continuation upward from the summit of said juncture or union of said northerly and southerly dipping limbs or sides of said vein, of ore and silver-bearing quartz or rock in place for a distance from 20 or 30 to more than 100 feet, and to what was the surface before the same was buried beneath the said lava flow; that such ore and silver-bearing quartz were deposited where the same are now found at the same time and during the same period that the main vein below was created, and
1172 from mineral-bearing solutions having the same source; that the dip is fairly conformable and strike or course of such upward continuation of ore and silver-bearing quartz is conformable to the dip and strike or course of said northerly-dipping limb or side of said vein from the summit of said juncture downward, and the Court finds that said upward continuation is a part of said vein or lode; that thence westerly, and for a distance of 360 feet, the northerly and southerly dipping limbs, sides, or slopes of said vein

do not unite or form a union or juncture in their upward course, but for that distance each of said limbs or sides has a separate and independent top or apex; that thence westerly, for a distance of 40 feet, the northerly and southerly dipping limbs, sides, or slopes of said vein are again found in conjunction, as in the said most easterly 360 feet; that thence westerly, and until said northerly and southerly dipping limbs, sides, or slopes of said vein intersect with and cross said northerly side line of said mining claim, they do not unite or form a union or juncture in their upward course, but for that distance each of said limbs or sides has a separate and independent top or apex; that between said distance of 40 feet, where said northerly and southerly dipping limbs, sides, or slopes of said vein, as aforesaid, unite or form a union or juncture in their course upward, and said points on said northerly side line of said mining claim where, as aforesaid, said contra-dipping limbs, sides or slopes of said vein respectively intersect said side line and cross the same and so depart from said mining claim, there are two points at which it appears that said contra-dipping limbs, sides or slopes of said vein on their upward course approach closely to a juncture or union, but as to said contra-dipping limbs, sides, or slopes of said vein at said two points actually forming a juncture or union on their upward
1173 course, the evidence is meager and unsatisfactory; that the point where the said northerly dipping limb or side of said vein departs from the said mining claim through the northerly side line thereof is 1120 feet westerly from the northeast corner of said claim measured along the northerly side line thereof; that the point where said southerly dipping limb or side of said vein departs from said mining claim through the northerly side line thereof is 1142½ feet westerly from the northeast corner of said claim measured along the northerly side line thereof; that throughout said distance of 40 feet, where the contra-dipping limbs or sides of said vein are found in conjunction, as hereinbefore stated, there is a continuation upward from the summit of the juncture or union of said two limbs or sides of said vein of ore or vein quartz to what was the surface before the same was covered by the lava flow; that the dip or downward course of both the northerly and southerly dipping sides or limbs of the vein where the two are found in conjunction, as aforesaid, and also in the places w-ere each, as aforesaid, has its separate and independent top or apex, is regular and practically free from undulations; that the said southerly dipping limb or side of the vein in the easterly portion of the West End claim, that is to say, the easterly 360 feet thereof, has been developed from the top or summit of said juncture of said contra-dipping limbs to and beyond the southerly side line of said claim, or for a distance, measured on the slope or downward course of said southerly dipping limb or side, of 800 feet or thereabouts, the average dip there being 17 degrees from the horizontal; that the westerly portion, that is to say, the westerly 300 feet of said southerly dipping limb or side of said vein found in the West End claim, has been developed from its top to and be-
1174 yond the southerly side line of said claim, or for a distance, measured on its slope or downward course, of 1000 feet or

thereabouts, the average dip there being 30 degrees from the horizontal; that the average dip of said northerly dipping limb or side of said vein, so far as the same has been developed in its downward course, is 17 degrees from the horizontal; that said vein is a fissure vein; that there is a difference in the strikes or courses of said northerly and southerly dipping limbs of said vein of about 40 degrees; that at said places and throughout said distances, where said contra-dipping limbs of said vein are found to intersect and form a juncture, as aforesaid, there has been a mingling of the mineralizations of said two limbs of said vein within the angle beneath the juncture of the said two limbs; that at such places and throughout said distances the footwail of said two limbs of said vein, within the angle beneath their said juncture, by the process of replacement has been converted into mineralized quartz for considerable distances below said juncture, said replacement quartz extending from limb to limb.

That the shaft known as the McQuillan shaft was the discovery shaft of the West End mining claim; that said discovery shaft encountered and disclosed no vein or lode of mineral-bearing rock in place until, in its downward course, it cut and disclosed said northerly dipping limb or part of said vein; that said northerly dipping limb of said vein was cut and disclosed in said discovery shaft on the 3rd day of April, 1903.

V.

That all of the ores mentioned in the Complaint and in the Amended Complaint herein, as having been mined, broken down, extracted and removed by the defendant within the surface boundaries extended downward vertically of said Eureka and
1175 Curtis lode mining claims, were mined, broken down, extracted and removed by the defendant from said vein and between the extralateral planes described in the next preceding Finding.

VI.

That all of said ores mention- in the next preceding Finding, so as aforesaid mined, broken down, extracted and removed by the defendant within the surface boundaries of said Eureka and Curtis lode mining claims extended downward vertically were the property of, and were owned by, the said defendant at the time they were so mined, broken down, extracted and removed; that none of the said ores, so as aforesaid mined, broken down, extracted and removed by the defendant within the surface boundaries extended downward vertically of said Eureka and Curtis lode mining claims was, at the time they were so mined, broken down, extracted and removed, or ever was, the property of said plaintiff.

That said plaintiff has not suffered or sustained any damage in any form whatever by reason of any act of the defendant alleged in the Complaint or the Amended Complaint herein.

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VII.

That the defendant never threatened to, or intended to, or ever claimed the right to enter upon or under the surface of said Eureka lode mining claim or said Curtis lode mining claim, other than that part or portion thereof included within said vein or lode herein found to have its top or apex within said West End mining claim and which on its downward course passes into and beneath the surface of said Eureka and Curtis lode mining claims; and the defendant never threatened to, or intended to, or ever claimed the right to enter upon or mine or extract ores from said vein from beneath the surface of said Eureka and Curtis lode mining claims other than that
1176 part or portion of said vein between vertical planes, one drawn through the easterly end line of said West End mining claim extended in its own direction indefinitely southerly, and another, parallel thereto, through a point on the northerly side line of said West End mining claim 1142½ feet westerly from the northeast corner of said mining claim, measured along the northerly side line thereof, extended in its own direction indefinitely southerly.

Conclusions of Law.

From the foregoing Findings of Fact the Court makes the following Conclusions of Law:

I.

That at all of the times mentioned in the Complaint and the Amended Complaint herein, the defendant was and now is, the owner of, in possession of, and entitled to the possession of, all of the vein from which the ores were taken as alleged in the Complaint and the Amended Complaint herein, and as herein found, between vertical planes, one drawn through the easterly end line of said West End mining claim, continued in its own direction indefinitely southerly, and another, parallel thereto, drawn through a point on the northerly side line of said mining claim, 1142½ feet westerly from the northeasterly corner of said mining claim, measured along the northerly side line thereof, continued in its own direction indefinitely southerly.

II.

That said plaintiff has not suffered or sustained any damage in any form whatever by reason of any act alleged in the Complaint or the Amended Complaint herein.

1177 III.

That said plaintiff is not entitled to take anything by its said action; that the said defendant have and recover from said plaintiff its costs in the sum of ——.

IV.

That all restraining orders or interlocutory injunctions heretofore made or issued in said cause should upon entry of judgment be dissolved.

And judgment is hereby ordered entered accordingly.
Dated at Tonopah, Nevada, May 27th, 1915.

MARK R. AVERILL,
Judge of said District Court.

A true and correct copy of the original on file in my office.

H. R. MIGHELS,
Clerk Supreme Court of Nevada.

1177½-1182 [Endorsed:] No. 2999. In the District Court of the Fifth Judicial District of the State of Nevada, in and for the County of Nye. Jim Butler Tonopah Mining Company, a corporation, Plaintiff, vs. West End Consolidated Mining Company, a corporation, Defendant. Findings of Fact and Conclusions of Law. Filed May 27, 1915. Robert G. Pohl, Clerk, by Lowell Daniels, Deputy. Robert G. Pohl, Clerk, Nye County, Tonopah, Nevada.

* * * * * * *

1183 That thereafter on June third, 1915, said District Court made and entered its Judgment herein, and the Judgment Roll in said cause, with said Judgment thereunto attached, was made up and filed as follows:—

1184 In the District Court of the State of Nevada, Fifth Judicial District, in and for Nye County.

JIM BUTLER TONOPAH MINING COMPANY (a Corporation), Plaintiff,

vs.

WEST END CONSOLIDATED MINING COMPANY (a Corporation), Defendant.

Complaint.

The plaintiff, Jim Butler Tonopah Mining Company, complains of the defendant, West End Consolidated Mining Company, and for cause of action alleges:—

I.

That the plaintiff, Jim Butler Tonopah Mining Company, is now and at all times since *on* or about October 1903, has been a corporation duly organized and existing under the laws of the State of Delaware, having its principal place of business in the City of Wilmington in said State, with power to own and operate mines, and during all of

said time has been and now is engaged in the carrying on of the business of mining in Nye County, State of Nevada.

That said plaintiff did, before commencing to do business in the State of Nevada, ever since has continued, and still continues to comply with all of the laws of the State of Nevada relating to foreign mining corporations doing business therein.

1185 II.

That the defendant, West End Consolidated Mining Company, is a corporation duly organized and existing under the laws of the State (formerly Territory) of Arizona, and said defendant has heretofore been and now is carrying on the business of mining in Nye County, State of Nevada, and that said County of Nye is the County in said State where the principal business of said corporation is conducted. That the said defendant has complied with the laws of the State of Nevada relating to foreign mining corporations doing business therein.

III.

That at all times herein mentioned the plaintiff has been the sole owner of and in the sole and actual possession, (except as hereinafter stated), and entitled to the immediate and exclusive possession of all those certain lots, pieces and parcels of land, together with the mines, lodes, ledges, veins and mineral deposits therein contained, situate, lying and being in the Tonopah Mining District, County of Nye, State of Nevada, described as follows:

First. That certain patented lode mining claim known as and called the Eureka Lode Mining Claim, being a portion of United States Survey designated by the United States Surveyor General for the State of Nevada as survey Number 2600.

Second. That certain patented lode mining claim known as and called the Curtis Lode Mining Claim, being a portion of United States Survey designated by the United States Surveyor General as survey Number 2042.

1186 That said Eureka and Curtis Lode Mining Claims are adjoining and contiguous to each other, and in connection with other properties adjoining and contiguous to said claims are, and at all times in this complaint mentioned were owned, possessed and worked by Plaintiff as one mine.

IV.

That within and upon said Eureka and Curtis Lode Mining Claims there were at all times mentioned in this complaint and now are situated certain lodes, veins and mineral deposits of great value, carrying gold, silver and other valuable metals.

V.

That the defendant, West End Consolidated Mining Company, at all times mentioned in this complaint was and now is in possession, claiming to be the owner of that certain Lode Mining Claim situated in said Tonopah Mining District, Nye County, Nevada, known as and called the West End Lode Mining Claim, being United States Survey designated by the United States Surveyor General for the State of Nevada as survey number 2024. Said West End Lode Mining Claim is contiguous to and adjoins said Eureka Lode Mining Claim, the property of this Plaintiff, as hereinbefore set forth. That within said West End Lode Mining Claim said Defendant has sunk certain shafts, winzes and other mine workings, and by means of crosscuts, winzes and other mine openings extended therefrom has passed outside of and beyond the boundaries of said West End Lode Mining Claim, and has entered upon and penetrated underneath the surface of the said Eureka and Curtis Lode Mining Claims, the property of this plaintiff.

1187

VI.

That by means of said mine workings so extended and made by said Defendant within and underneath the surface of said Eureka and Curtis Lode Mining Claims, the said Defendant has wilfully, wrongfully, unlawfully, fraudulently and secretly, and without the license, knowledge or consent of the Plaintiff, and continuously for more than a year last past, entered upon and broken into the said Eureka and Curtis Lode Mining Claims, the property of this Plaintiff, and has worked, mined and extracted ore from the lodes, veins and mineral deposits lying and embraced within vertical planes passed through the exterior boundaries of Plaintiff's said lode mining claims, and is now working, mining and extracting ore from Plaintiff's said mining claims, lodes, veins and mineral deposits, and from that portion of the ground embraced within said vertical planes passed through the exterior boundaries of Plaintiff's said lode mining claims.

VII.

Plaintiff further alleges that within one year last past, through the mining operations of defendant so conducted and carried on as aforesaid within the exterior boundaries of the mining ground of Plaintiff, to-wit, said Eureka and Curtis Lode Mining Claims, said defendant has mined and extracted twenty-five thousand (25,000) tons of gold, silver and other mineral bearing ores then and there the property of this Plaintiff, and has willfully, unlawfully, and maliciously taken out, carried away and converted the same to its own use, without the consent or knowledge of the Plaintiff; that the value of said twenty-five thousand (25,000) tons of gold, silver and other

1188 mineral bearing ore so mined and extracted, taken out, carried away and converted, as aforesaid, was and is as Plaintiff is informed and believes the sum of Five Hundred Thousand ($500,000.00) Dollars.

VIII.

Plaintiff further alleges that defendant is now working and mining within the exterior boundaries of the lands and mining claims of Plaintiff hereinbefore described, and is now actually engaged in mining and extracting gold, silver and other mineral bearing ores from the veins, lodes and mineral deposits contained therein, and is extracting large quantities of valuable ores therefrom, the exact quantity of which Plaintiff is not able to state, but on its information and belief it alleges is something in excess of four thousand (4,000) tons per month, the exact value of which is difficult of ascertainment and estimation, and defendant does now claim the right and threatens to, and will, unless restrained by the order of this Honorable Court, continue said trespass and the mining and extracting of said valuable ores from Plaintiff's said mining ground and claims, to-wit, said Eureka and Curtis Lode Mining Claims, and from the veins, lodes and mineral deposits contained therein, and will mine and extract therefrom all the mineral deposits and ore therein contained, and will thereby continue to injure and waste Plaintiff's said mining property, and to destroy and deprive said mining land of all value.

IX.

That plaintiff has no means of ascertaining, and it is impossible to ascertain or measure the value or quantity of mineral bearing ores, or to estimate the pecuniary value thereof which will
1189 be taken as aforesaid, or which will be taken by the Defendant from Plaintiff's said mining ground and from Plaintiff's veins, lodes and mineral deposits, contained therein, and this Plaintiff cannot ascertain, and it is difficult, if not impossible, to ascertain the amount of pecuniary compensation which would adequately compensate plaintiff for the injuries and damages that Defendant now threatens to and will inflict upon Plaintiff and upon the mining grounds and properties of Plaintiff hereinbefore described. That said mining ground and properties of Plaintiff have no value other than for the veins, lodes and mineral deposits therein. Plaintiff alleges that unless restrained by the order of this Honorable Court, defendant will inflict upon Plaintiff, and upon the mining properties of Plaintiff, irreparable injury.

Wherefore, Plaintiff prays judgment against the Defendant—

(1) That defendant and its agents, servants and employees be enjoined from working, mining or entering upon any portion of Plaintiff's said properties, and the mining ground and claims hereinbefore described as owned and possessed by the Plaintiff, and the mine, veins, lodes and mineral deposits contained therein pending this action.

(2) That by a final judgment of this Court Defendant be perpetually enjoined from doing any of the acts above specified, and that all entries to any portion of Plaintiff's said mining prop-

1190 erties by Defendant, by means of any of the underground works of Defendant, be effectually closed by the order of this Court, at the expense of Defendant.

(3) That Plaintiff have judgment against Defendant for Five Hundred Thousand ($500,000) Dollars, and that said Judgment be trebled.

(4) That Plaintiff recover costs.

(5) That Plaintiff have judgment for such other and further relief against the defendant in the premises as is just and equitable.

CURTIS H. LINDLEY,
HUGH H. BROWN,
J. H. EVANS,
Attorneys for Plaintiff.

STATE OF CALIFORNIA,
City and County of San Francisco, ss:

Clyde A. Heller, being duly sworn, deposes and says:

I am an officer, to-wit, President of the Jim Butler Tonopah Mining Company, Plaintiff in this action. I make this affidavit for and on behalf of said Plaintiff.

I have read the foregoing complaint and know the contents thereof. The same is true of my own knowledge, except the matters therein stated on information and belief, and that as to those matters I believe it to be true.

CLYDE A. HELLER.

Subscribed and sworn to before me this 4th day of April, 1914.

[NOTARIAL SEAL.] EUGENE W. LEVY,
Notary Public in and for the City and County of San Francisco, State of California.

A true and correct copy.
H. R. MIGHELS,
Clerk Supreme Court of Nevada.

Endorsed: Mark R. Averill, District Judge. Filed April 6, 1914. Robert B. Pohl, Clerk, by Lowell Daniels, Deputy.

1191 In the District Court of the State of Nevada, Fifth Judicial District, in and for Nye County.

JIM BUTLER TONOPAH MINING COMPANY (a Corporation), Plaintiff,
v.
WEST END CONSOLIDATED MINING COMPANY (a Corporation), Defendant.

Answer.

Comes now the defendant above named, West End Consolidated Mining Company, and makes answer to the complaint of the plaintiff in the above entitled action, and for answer thereto:

I.

Admits the first, second and fifth paragraphs of said complaint.

II.

Answering the third paragraph of said complaint, this defendant admits that the said plaintiff is the owner, in possession and entitled to the possession, of the surface of the Eureka Lode Mining Claim and the Curtis Lode Mining Claim, mentioned in said complaint, and that each of said mining claims is patented, and that the same are adjoining and contiguous mining claims, but denies that said plaintiff is, or that it, or any of its predecessors in interest, ever was, the owner, in possession or entitled to the possession, of all
1192 mines, lodes, ledges, veins or mineral deposits beneath the surface of either of said mining claims; and to the contrary thereof this defendant alleges that there is found beneath the surface of each of said claims, and within the exterior boundaries thereof, extended downward vertically, a part or portion of a vein or lode of rock in place, bearing gold, silver and *and* other valuable metals; that no part of the top or apex of said vein or lode is found within the exterior boundaries, extended downward vertically, of either the said Eureka Mining Claim, or the said Curtis Lode Mining Claim, but that the top or apex of said vein or lode is found wholly within the surface boundaries, extended downward vertically, of the West End Mining Claim, mentioned in said complaint, and that this defendant is, and for many years last past continuously has been, the owner, in possession and entitled to the possession of said West End Mining Claim, and of said lode or vein, throughout its entire depth, so, as aforesaid, having its top or apex within the surface boundaries of the said West End Mining Claim, extended downward vertically. And denies that the said plaintiff is, or that it, or any of its predecessors ever was, the owner, in possession, or entitled to the possession, of any part of said lode or vein.

III.

Answering the fourth paragraph of said complaint, this defendant admits that within the said Eureka and Curtis Lode Mining Claims, there are certain lodes, veins and mineral deposits, carrying gold, silver and other valuable metals; but this defendant is informed and believes, and upon such information and belief alleges, that there is not, within the exterior boundaries, extended downward
1193 vertically, of either the said Eureka Lode Mining Claim, or the said Curtis Lode Mining Claim, any known vein, lode or mineral deposit, the top or apex of which is found within the surface boundaries, extended downward vertically, of either of said mining claims.

IV.

Answering the sixth paragraph of said complaint, this defendant denies that it has ever, at any time, wrongfully, unlawfully, fraud-

ulently or secretly, or without the license, knowledge or consent of said plaintiff, mined or extracted any ore from any lode, vein or mineral deposit, lying or embraced within vertical planes passed through the exterior boundaries of either the said Eureka Lode Mining Claim or the said Curtis Lode Mining Claim, except from the said lode or vein, so as aforesaid, having its top or apex within the exterior boundaries extended downward vertically of the said West End Mining Claim, and so, as aforesaid, owned and possessed by this defendant. And in like manner denies that it is now, or at the time of the commencement of this action was, working, mining or extracting any ore from either of the said mining claims of the said plaintiff, or from any lode, vein or mineral deposit therein, except from the said lode or vein, so as aforesaid having its top or apex within the surface boundaries, extended downward vertically, of the said West End Mining Claim, and owned and possessed, as aforesaid by this defendant.

V.

Answering the seventh paragraph of said complaint this defendant denies that within one year last past, or at any other time, or at all, this defendant has unlawfully, or maliciously, mined or ex-
1194 tracted, taken out, carried away, or *or* converted to its own use, 25,000 tons, or any other amount whatever, of gold, silver, or other mineral-bearing ores, which were the property of said plaintiff, of the value of $500,000.00 or of any value whatsoever. Admits that it has carried on mining operations within the exterior boundaries of the Eureka and Curtis mining claims, and in that behalf, alleges, that said mining operations have been prosecuted entirely upon said lode or vein so as aforesaid having its top or apex within the exterior boundaries, extended downward vertically, of the said West End Mining claim, and so, as aforesaid, owned and possessed by this defendant; that in said mining operations it has mined and extracted from said lode or vein beneath the surface of said Eureka and Curtis mining claims not to exceed 23,341 tons of ore, the aggregate net value of which did not exceed $204,300.00, which amount and value comprise all the ores extracted by the defendant from the premises in controversy in this action which were or could be milled or treated at any profit.

VI.

Answering the eighth paragraph of said complaint, this defendant admits that at the time of the commencement of this action, it was working, and actually engaged in mining and extracting gold, silver and other mineral-bearing ores, contained and found within the exterior boundaries, extended downward vertically, of plaintiff's said mining claims, namely the said Eureka Lode Mining Claim and the said Curtis Lode Mining Claim, but alleges that all of its said work of mining and extraction of ores, or other material, was confined to, and did not extend beyond, that portion of said lode or vein so found

beneath the surface and within the exterior boundaries, ex-
1195 tended downward vertically, of the said Eureka Lode Mining Claim and the said Curtis Lode Mining Claim, so as aforesaid having its top or apex within the surface boundaries, extended downward vertically, of the said West End Mining Claim, owned and possessed, as aforesaid, by this defendant.

Further answering said eighth paragraph, this defendant denies that it ever claimed the right, or threatened to, or that unless restrained by the order of this Honorable Court it threatened, intended to, or would have, trespassed upon either of the said mining claims of the said plaintiff; and in like manner denies that it ever did, or would have threatened, or intended to, or would have, but for said restraining order, mined or extracted any ore, or other material from either of said mining claims, or from any vein, lode or other mineral deposit, contained or found within the exterior boundaries, extended downward vertically, thereof, except from that portion of said vein or lode, so as aforesaid found within the exterior boundaries, extended down vertically, of the said Eureka Lode Mining Claim and the said Curtis Lode Mining Claim, and having, as aforesaid, its top or apex within the exterior boundaries, extended downward vertically, of the said West End Mining Claim, and owned and possessed by this defendant as aforesaid.

And this defendant, further answering the said eighth paragraph, denies that it ever did, or ever threatened, or intended to, injure or waste either of said mining claims of said plaintiff, or to destroy or deprive said mining land of said plaintiff of any value whatever.

VII.

Answering the ninth paragraph of said complaint, this defendant alleges that it never has, at any time, nor has it ever threat-
1196 ened or intended, at any time, to take any mineral-bearing ores, or other thing whatsoever, from any of plaintiff's said mining ground, or from any vein, lode or mineral deposit found or contained within the surface boundaries, extended downward vertically, of either the said Eureka Lode Mining Claim, or the said Curtis Lode Mining Claim, except from that portion of said vein or lode, so as aforesaid having its top or apex within the exterior boundaries, extended downward vertically of the said West End Mining Claim.

Further answering said paragraph, this defendant denies that it ever has, or has ever threatened, or intended to, injure or damage, in any manner whatever, any mining ground or property whatever of said plaintiff, and denies that unless restrained by the order of this Honorable Court it threatened, or intended to, or would have, inflicted irreparable, or any, injury whatever upon said plaintiff, or any of said plaintiff's property.

VIII.

And for a further answer to said complaint, this defendant alleges that it now is, and it and its predecessors in interest, continuously for

more than thirteen years last past has been, the owner of, in the possession of, and entitled to the possession of the West End Mining Claim, mentioned in said complaint, and of all veins or lodes (throughout their entire depth) of rock in place, bearing gold, silver or other valuable metals, the tops or apices of which are found within the exterior boundaries, extended downward vertically, of the said West End Mining Claim; that the Government of the United States, by patent bearing date the 21st day of July, 1904, granted and conveyed said West End Mining Claim to this defendant's grantor and predecessor in interest, namely, the Tonopah Extension Mill-
1197 ing & Mining Company, a corporation; that said mining claim is described in said patent as follows, towit:

Beginning at Corner No. 1, from which the south corner of Section 35 in Township 3 North of Range 42 Mount Diablo Meridian bears South 2 deg. 12 min. West 1248.6 feet distant.

Thence, first course, south 74 deg. 42 min. West 750 feet to Corner No. 2; 1406.8 feet to Corner No. 3.

Thence, second course, North 11 deg. 20 min. W. 301 feet to Corner No. 4.

Thence, third course, North 5 deg. 31 min. East 313.3 feet to Corner No. 5.

Thence, fourth course, North 74 deg. 6 min. East 749.9 feet to corner No. 6.

Thence, fifth course, North 74 deg. 42 min. East 608 feet to Corner No. 7.

Thence, sixth course, South 83 deg. 58 min. East 134.5 feet to corner No. 8.

Thence, seventh course, South 5 deg. 31 min. West 269.8 feet to a point from which discovery shaft bears South 74 deg. 42 min. West 204.5 feet; 590.7 feet to corner No. 1, the place of beginning.

That there is a vein or lode of rock in place, bearing gold, silver and other valuable metals, which, at its top or apex, and on its course or strike, crosses the easterly end line of said West End Mining Claim, and thence, at its top or apex, and on its course or strike, continues westerly between the side lines of said mining claim, for a distance of, to-wit: 1175 feet.

That said vein dips in a southerly direction, and in its course downward so far departs from the perpendicular as to extend outside and beyond a vertical plane, drawn downward through the southerly side line of said claim, and continues in its downward course, under and beneath the surface of the said mining claims of said plaintiff, namely, the Eureka Lode Mining Claim and the Curtis Lode Mining Claim.

That this defendant is, and for many years last past has been, the owner of, in the possession and entitled to the possession of said vein or lode, throughout its entire depth, between planes, one
1198 drawn through the easterly end line of said claim, continued indefinitely in its own direction southerly, and another drawn parallel thereto, through a point, to-wit: 1175 feet westerly thereof, continued indefinitely, as aforesaid.

That this defendant has never mined or extracted any ore or mineral-bearing earth or rock, within the surface boundaries, extended downward vertically, of either the said Eureka Lode Mining Claim or the said Curtis Lode Mining Claim, except from that portion of said vein or lode, so as aforesaid having its top or apex within the said West End Mining Claim, which, in its downward course, lies within the exterior boundaries, extended downward vertically, of the said Eureka Mining Claim and the said Curtis Lode Mining Claim; and this defendant alleges that all the ore and mineral-bearing earth or rock, which it has mined from said vein or lode (and within the premises in controversy in this action), beneath the surface of the said Eureka Lode Mining Claim and the said Curtis Lode Mining Claim, which was, by this defendant, milled or treated (or which could be, by any one, milled or treated at any profit, after the same had been mined and extracted), did not exceed 23,341 tons the aggregate net value of which did not exceed $204,300.00.

This defendant further alleges that the mining and extraction by it of said ore from that portion of said vein lying within the exterior boundaries, extended downward vertically, of the said Eureka Lode Mining Claim and the said Curtis Lode Mining Claim, and which has its top or apex within the exterior boundaries, extended downward vertically, of the said West End Mining Claim, *and* as aforesaid, and none other, constitute the pretended wrong and injuries complained of by plaintiff in its said complaint.

1199 IX.

And further answering said complaint defendant alleges that all of the ores mined, extracted and removed by defendant within the surface boundaries extended downward vertically of said Eureka and said Curtis Lode Mining Claims as alleged in the complaint, were mined and extracted from a lode, ledge or vein no part of the top or apex of which was or is to be found within the surface boundaries of said Eureka and said Curtis Lode Mining Claims extended downward vertically; that at all times mentioned in the complaint and for a long time theretofore the defendant was, has been and now is the owner of, in possession of, and entitled to the possession of that part or portion of said lode, ledge or vein so situate within the surface boundaries extended downward vertically of said Eureka and said Curtis Lode Mining Claims from which said ores mentioned in the complaint were by the defendant so mined, extracted and removed.

Wherefore, having fully answered, this defendant prays that it be hence dismissed with its costs in this behalf incurred, and that said plaintiff take nothing by its said action.

PECK, BUNKER & COLE,
HORATIO ALLING,
DICKSON, ELLIS, ELLIS & SCHULDER,
CHENEY, DOWNER, PRICE & HAWKINS,
Attorneys for Defendant.

A true and correct copy of the original on file in my office.
H. R. MIGHELS,
Clerk Supreme Court of Nevada.

1200 STATE OF CALIFORNIA,
County of Alameda, ss:

L. W. Bennett, being duly sworn, on oath deposes and says: I am an officer, to-wit, the Secretary of the West End Consolidated Mining Company, a corporation defendant in this action. I make this affidavit for and on behalf of said defendant.

I have read the foregoing answer and know the contents thereof. The same is true of my own knowledge, except the matters therein stated on information and belief, and that as to those matters, I believe it to be true.

L. W. BENNETT.

Subscribed and sworn to before me this 3 day of July, 1914.
[SEAL.] ANGUS CLARK,
Notary Public in and for the County of Alameda, State of California.

A true and correct copy.
H. R. MIGHELS,
Clerk Supreme Court of Nevada.

Endorsed: Mark R. Averill, District Judge. Filed July 6, 1914. Robert B. Pohl, Clerk, by Lowell Daniels, Deputy.

1200½ Service of foregoing answer by copy admitted this 3d day of July 1914.

CURTIS H. LINDLEY,
HUGH H. BROWN,
Attorneys for Plaintiff.

It is hereby stipulated that the foregoing answer may be filed on July 6th 1914.

CURTIS H. LINDLEY,
HUGH H. BROWN,
Attorneys for Plaintiff.
PECK, BUNKER & COLE,
HORATIO ALLING,
DICKSON, ELLIS, ELLIS & SCHULDER,
CHENEY, DOWNER, PRICE & HAWKINS,
Attorneys for Defendant.

[Endorsed:] No. 2999, Dept. —. Copy. District Court, State Nevada, Fifth Judicial District, Nye County. Jim Butler Tonopah Mining Company, a Corp., Plaintiff, v. West End Cons. Mining Co., a Corp., Defendant. Answer. July 6, 1914. Robert B. Pohl, Lowell Daniel.

Peck, Bunker & Cole, Attorneys, 503 Syndicate Building, Oakland, Cal.; 910 Crocker Building, San Francisco, Cal.

1201 Copy.

In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

No. —.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Replication.

The plaintiff above named, Jim Butler Tonopah Mining Company, by way of its reply to the answer of the defendant, West End Consolidated Mining Company, alleges and denies as follows:

I.

This plaintiff denies that there exists within the boundaries of either the said Eureka or the said Curtis Lode Mining claims, and situated vertically beneath the surface thereof, any mines or lodes or ledges or veins or mineral deposits which are a part or portion of any vein or lode of rock in place bearing gold or silver or any other valuable metal or metals which has its top or apex situated either wholly or in part or at all within the surface boundaries, extended downward vertically, of said West End Mining claim and on the contrary this plaintiff alleges that there is not within the surface
1202 boundaries of said West End Mining Claim extended downward vertically the top or apex or any portion of the top or apex of any vein or lode which embraces or includes on its downward course any of the ore bodies in controversy in this action and this plaintiff further alleges that it is the owner and entitled to the possession of all mines, lodes, ledges, veins and mineral deposits, and portions thereof, situated vertically beneath the surface of said Eureka and said Curtis lode mining claims as more fully set forth in its complaint heretofore filed herein.

II.

Plaintiff denies that, in the prosecution of defendant's said mining operations, vertically beneath the surface of plaintiff's said mining premises, the defendant mined and extracted not to exceed twenty-three thousand, three hundred forty-one (23,341) tons of ore; plaintiff denies that the aggregate net value thereof did not exceed Two Hundred Four Thousand, Three Hundred Dollars ($204,300); and plaintiff denies that said alleged tonnage and value comprise all the

ores, extracted by defendant from vertically beneath the surface of plaintiff's said premises, which were or could be milled or treated at any profit. To the contrary, plaintiff alleges that said tonnage, so mined and extracted, by defendant from vertically beneath the surface of plaintiff's said premises, and which were and could be milled at a profit, far exceeded twenty-three thousand, three hundred forty-one (23,341) tons,—the exact tonnage being unknown to plaintiff,—and that the aggregate net value thereof far exceeded Two Hundred Four Thousand Three Hundred Dollars ($204,300),—the exact net value being unknown to plaintiff.

III.

Replying to Paragraph VIII of said Answer, plaintiff ad-
1203 mits that the United States Government, by Patent bearing date the 21st day of July, 1904, granted and conveyed said West End mining claim to the defendant's grantor and predecessor in interest, namely, the Tonopah Extension Milling & Mining Company, a corporation.

Plaintiff admits that said West End mining claim is described in said Patent as follows, to-wit:

Beginning at Corner No. 1, from which the south corner of Section 35 in Township 3 North of Range 42 Mount Diablo Meridian bears South 2 deg. 12 min. West 1248.6 feet distant.

Thence, first course, south 74 deg. 42 min. West 750 feet to Corner No. 2; 1406.8 feet to Corner No. 3;

Thence, second course, North 11 deg. 20 min. W. 301 feet to Corner No. 4.

Thence, third course, North 5 deg. 31 min. East 313.3 feet to Corner No. 5.

Thence, fourth course, North 74 deg. 6 min. East 749.9 feet to Corner No. 6.

Thence, fifth course, North 74 deg. 42 min. East 608 feet to Corner No. 7.

Thence sixth course, South 83 deg. 58 min. East 134.5 feet to Corner No. 8.

Thence seventh course, South 5 deg. 31 min. West 269.8 feet to a point from which discovery shaft bears South 74 deg. 42 min. West 204.5 feet; 590.7 feet to Corner No. 1, the place of beginning.

The plaintiff admits that the defendant now is, and with its predecessors in interest continuously for thirteen (13) years last past, has been, the owner of, in possession, and entitled to possession of said West End mining claim as above described; but plaintiff denies that the defendant, or its predecessor, now is, or ever has been, the owner, in possession, or entitled to possession, of all or any veins or lodes throughout their entire depth,—or any depth whatsoever be-
1204 yond the vertical boundary line planes, of said West End mining claim,—which veins or lodes have their tops or apices within said West End mining claim, or the vertical boundary line planes thereof; plaintiff denies that there are any veins or lodes or rock in place bearing gold, silver or other valuable metals, within

said West End mining claim, whose tops or apices are within the exterior boundary lines of the said claim produced vertically downward.

Plaintiff denies that there is a vein or lode or rock in place bearing gold, silver and other precious metals, or gold, or silver, or other precious metals, which at its top or apex, and on its course or strike, or on its course or strike, crosses the Easterly or any end line of said West End mining claim, and thence, at its top or apex, and on its course or strike, or on its course or strike, continues Westerly or in any other direction, between the side lines of said West End mining claim, for a distance of eleven hundred seventy-five feet (1175'), or any other distance, or at all.

Plaintiff denies that there is any vein which has its top or apex within said West End mining claim, and which dips in a Southerly or any other direction and which in its course downward departs from the perpendicular, so as to extend outside and beyond a vertical plane drawn downward through the Southerly side line of the said West End claim, and which continues in its downward course, under and beneath the surface of said Eureka mining claim and said Curtis mining claim, or either of them.

Plaintiff denies that the defendant is, and for many years
1205 has been, or is, or ever was, the owner of, in possession and entitled to the possession, or the owner, or in possession, or entitled to possession, of said alleged vein or lode, throughout its entire depth, between planes, one drawn through the Easterly end line of said West End mining claim, continued indefinitely in its own direction Southerly, and another drawn parallel thereto, through a point, to-wit, eleven hundred seventy-five feet (1175') Westerly thereof, or through any other point Westerly of said east end line and continued indefinitely, or at all.

Plaintiff denies that the defendant never has mined or extracted any ore or mineral-bearing earth or rock within the boundaries, extended downward vertically, of either the said Eureka lode mining claim, or the said Curtis lode mining claim, except from a portion of said alleged vein or lode having its alleged top or apex within the said West End mining claim, which, in its alleged downward course, lies within the exterior boundaries, extended downward vertically, of the said Eureka lode mining claim and the said Curtis lode mining claim.

Plaintiff denies that there is any portion of a vein or lode, within the exterior boundaries, extended downward vertically, of the said Eureka lode mining claim, and the said Curtis lode mining claim, or either of them, which has its top or apex or any part thereof, within the exterior boundaries, extended downward vertically, of the said West End mining claim.

Plaintiff denies that all the ore and mineral-bearing earth or rock, which the defendant mined, within the premises in controversy in this action, to-wit, within the exterior boundary lines of said
1206 Curtis and Eureka mining claim, which was by the defendant milled or treated, or which could be, by anyone, milled or treated at any profit, after the same had been mined and extracted,

did not exceed twenty-three thousand, three hundred forty-one (23,341) tons; plaintiff denies that the aggregate net value thereof did not exceed Two Hundred Four Thousand, Three Hundred Dollars ($204,300). To the contrary, plaintiff alleges that said tonnage, so mined and extracted, by defendant from vertically beneath the surface of plaintiff's said premises, and which were and could be milled at a profit, far exceeded twenty-three thousand, three hundred forty-one (23,341) tons,—the exact tonnage being unknown to plaintiff,—and that the aggregate net value thereof far exceeded Two Hundred Four Thousand, Three Hundred Dollars ($204,300),—the exact net value being unknown to plaintiff.

IV.

Plaintiff alleges that the Westerly end boundary of said West End mining claim is not a straight line, but said boundary is a broken line composed of two segments having different directions, all of which more fully appears in the description contained in the patent for said West End mining claim issued by the United States and more fully set forth in the Answer of said defendant heretofore filed herein.

V.

Plaintiff denies that at all times mentioned in the complaint, and for a long time prior theretofore, or ever, or at all, the defendant was, has been, and now is, or was, or has been, or now is, the owner, in lawful possession and entitled to possession, or the owner, or in lawful possession, or entitled to possession, of that part or portion of said lode, ledge, or vein, so situate within the surface boundaries, extended downwards vertically, of said Eureka and said Curtis lode mining claim-, or either of them, from which said ores were by the defendant so mined, extracted and removed, and plaintiff alleges that whatever possession defendant has ever had of said premises so described has been entirely without right and an unlawful invasion of the rights of this plaintiff as more fully set forth in plaintiff's complaint heretofore filed herein.

Wherefore, plaintiff prays judgment according to its complaint herein.

CURTIS H. LINDLEY,
WILLIAM E. COLBY,
HUGH H. BROWN,
J. H. EVANS,
Attorneys for the Plaintiff.

STATE OF NEVADA,
County of Nye, ss:

Clyde A. Heller, being first duly sworn, according to law, says: That he is an officer, to-wit, the President, of Jim Butler Tonopah Mining Company, plaintiff named in the above and foregoing cause,

and that he makes this verification in his capacity as such President, and for and in behalf of the plaintiff corporation; that he has read the above and foregoing Replication and knows the contents thereof, and that the same are true of his own knowledge, except as to matters therein stated on information and belief, and as to those matter-, he believes it to be true.

CLYDE A. HELLER.

Subscribed and sworn to before me, this 21st day of August, 1914.

[NOTARIAL SEAL.] S. R. MOORE,
Notary Public in and for Nye County State of Nevada.

Commission Expires: Aug. 1, 1916.

A true and correct copy of the original now on file in my office.

H. R. MIGHELS,
Clerk Supreme Court of Nevada.

Endorsed: Mark A. Averill, District Judge. Filed August 28, 1914. Robert B. Pohl, Clerk, by Lowell Daniels, Deputy.

1209 In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

No. 2999.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,

vs.

WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Amended Complaint.

Comes now the Jim Butler Tonopah Mining Company, a corporation, plaintiff above-named, and by leave of the Court first had and obtained, files this, its Amended Complaint, and alleges:

I.

That the plaintiff, Jim Butler Tonopah Mining Company, is now and at all times since on or about October, 1903, has been a corporation duly organized and existing under the laws of the State of Delaware, having its principal place of business in the City of Wilmington in said State, with power to own and operate mines, and during all of said time has been and now is engaged in the carrying on of the business of mining in Nye County, State of Nevada.

That said plaintiff did, before commencing to do business in the State of Nevada, ever since has continued, and still continues to comply with all of the laws of the State of Nevada relating to foreign mining corporations doing business therein.

1210 II.

That the defendant, West End Consolidated Mining Company, is a corporation duly organized and existing under the laws of the State (formerly Territory) of Arizona, and said defendant has heretofore been and now is carrying on the business of mining in Nye County, State of Nevada, and that said County of Nye is the County in said State where the principal business of said corporation is conducted. That the said defendant has complied with the laws of the State of Nevada relating to foreign mining corporations doing business therein.

III.

That at all times herein mentioned the plaintiff has been the sole owner of and in the sole and actual possession, (except as hereinafter stated), and entitled to the immediate and exclusive possession of all those certain lots, pieces and parcels of land, together with the mines, lodes, ledges, veins and mineral deposits therein contained, situate, lying and being in the Tonopah Mining District, County of Nye, State of Nevada, described as follows:

First. That certain patented lode mining claim known as and called the Eureka Lode Mining Claim, being a portion of United States Survey designated by the United States Surveyor General for the State of Nevada as survey Number 2600.

Second. That certain patented lode mining claim known as and called the Curtis Lode Mining Claim, being a portion of United States Survey designated by the United States Surveyor General as survey Number 2042.

1211 That said Eureka and Curtis Lode Mining Claims are adjoining and contiguous to each other, and in connection with other properties adjoining and contiguous to said claims are, and at all times in this complaint mentioned were owned, possessed and worked by plaintiff as one mine.

IV.

That within and upon said Eureka and Curtis Lode Mining Claims there were at all times mentioned in this complaint and now are situated certain lodes, veins and mineral deposits of great value, carrying gold, silver and other valuable metals.

V.

That the defendant, West End Consolidated Mining Company, at all times mentioned in this complaint was and now is in possession, claiming to be the owner of that certain Lode Mining Claim situated in said Tonopah Mining District, Nye County, Nevada, known as and called the West End Lode Mining Claim, being United States Survey designated by the United States Surveyor General for the State of Nevada as survey number 2024. Said West End Lode Min-

ing Claim is contiguous to and adjoins said Eureka Lode Mining Claim, the property of this Plaintiff, as hereinbefore set forth. That within said West End Lode Mining Claim said Defendant has sunk certain shafts, winzes and other mine workings, and by means of crosscuts, winzes and other mine openings extended therefrom has passed outside of and beyond the boundaries of said West End Lode Mining Claim, and has entered upon and pentrated underneath the surface of the said Eureka and Curtis Lode Mining Claims, the property of this plaintiff.

1212 VI.

That by means of said mine workings so extended and made by said Defendant within and underneath the surface of said Eureka and Curtis Lode Mining Claims, the said Defendant has wilfully, wrongfully, unlawfully, fraudulently and secretly, and without the license, knowledge or consent of the Plaintiff, and continuously for more than six (6) months last past, entered upon and broken into the said Eureka and Curtis Lode Mining Claims, the property of this Plaintiff, and has worked, mined and extracted ore from the lodes, veins and mineral deposits lying and embraced within vertical planes passed through the exterior boundaries of Plaintiff's said lode mining claims, and is now working, mining and extracting ore from Plaintiff's said mining claims, lodes, veins and mineral deposits, and from that portion of the ground embraced within said vertical planes passed through the exterior boundaries of Plaintiff's said lode mining claims.

VII.

Plaintiff further alleges that within one year last past, through the mining operations of defendant so conducted and carried on as aforesaid within the exterior boundaries of the mining ground of Plaintiff, to-wit: said Eureka and Curtis Lode Mining Claims, said defendant has mined and extracted upwards of fifty-five thousand seven hundred sixty nine (55,769) tons of gold, silver and other mineral bearing ores then and there the property of this Plaintiff, and has wilfully, unlawfully, and maliciously taken out, carried away and converted the same to its own use, without the consent or knowledge of the Plaintiff; that the value of said 55,769 tons of gold, silver and other mineral bearing ore so mined and extracted, taken out, carried away and converted, as aforesaid, was and is as Plaintiff is
1213 informed and believes, the sum of One Million Sixty-five thousand seven hundred eighteen Dollars ($1,065,718.00).

VIII.

Plaintiff further alleges that defendant is now working and mining within the exterior boundaries of the lands and mining claims of Plaintiff hereinbefore described, and is now actually engaged in mining and extracting gold, silver and other mineral bearing ores from the veins, lodes and mineral deposits contained therein, and is

extracting large quantities of valuable ores therefrom, the exact quantity of which Plaintiff is not able to state, but on its information and belief it alleges is something in excess of four thousand (4,000) tons per month, the exact value of which is difficult of ascertainment and estimation, and defendant does now claim the right and threatens to, and will, unless restrained by the order of this Honorable Court, continue said trespass and the mining and extracting of said valuable ores from Plaintiff's said mining ground and claims, to-wit, said Eureka and Curtis Lode Mining Claims, and from the veins, lodes and mineral deposits contained therein, and will mine and extract therefrom all the mineral deposits and ore therein contained, and will thereby continue to injure and waste Plaintiff's said mining property, and to destroy and deprive said mining land of all value.

IX.

That plaintiff has no means of ascertaining, and it is impossible to ascertain or measure the value or quantity of mineral bearing ores, or to estimate the pecuniary value thereof which will be
1214 taken as aforesaid, or which will be taken by the Defendant from Plaintiff's said mining ground and from Plaintiff's veins, lodes and mineral deposits contained therein, and this Plaintiff cannot ascertain, and it is difficult, if not impossible, to ascertain the amount of pecuniary compensation which would adequately compensate plaintiff for the injuries and damages that Defendant now threatens to and will inflict upon Plaintiff and upon the mining grounds and properties of Plaintiff hereinbefore described. That said mining ground and properties of Plaintiff have no value other than for the veins, lodes and mineral deposits therein. Plaintiff alleges that unless restrained by order of this Honorable Court, defendant will inflict upon Plaintiff, and upon the mining properties of Plaintiff, irreparable injury.

Wherefore, Plaintiff prays judgment against the Defendant—

(1) That defendant and its agents, servants and employees be enjoined from working, mining or entering upon any portion of Plaintiff's said properties, and the mining ground and claims hereinbefore described as owned and possessed by the Plaintiff, and the mine, veins, lodes and mineral deposits contained therein pending this action.

(2) That by a final judgment of this Court Defendant be perpetually enjoined from doing any of the acts above specified, and that all entries to any portion of Plaintiff's said mining properties by Defendant, by means of any of the underground works of
1215 Defendant, be effectually closed by the order of this Court, at the expense of Defendant.

(3) That Plaintiff have judgment against Defendant for One Million, Sixty-five thousand, seven hundred eighteen Dollars ($1,065,718.00), and that said judgment be trebled.

(4) That Plaintiff recover costs.

(5) That Plaintiff have judgment for such other and further relief against the defendant in the premises as is just and equitable.

CURTIS H. LINDLEY,
WM. E. COLBY,
HUGH H. BROWN,
J. H. EVANS,
Attorneys for Plaintiff.

1216 STATE OF NEVADA,
County of Nye, ss:

Clyde A Heller, being duly sworn, deposes and says:

I am an officer, to-wit, President of the Jim Butler Tonopah Mining Company, Plaintiff in this action. I make this affidavit for and on behalf of said Plaintiff.

I have read the foregoing complaint and know the contents thereof. The same is true of my own knowledge, except the matters therein stated on information and belief, and that as to those matters I believe it to be true.

CLYDE A. HELLER.

Subscribed and sworn to before me, this 7th day of December, 1914.

[SEAL.] HUGH H. BROWN,
Notary Public in and for Nye County, State of Nevada.

Endorsed: Mark R. Averill, District Judge. Filed December 7, 1914. Robert B. Pohl, Clerk, by Lowell Daniels, Deputy.

A true and correct copy,
H. R. MIGHELS,
Clerk Supreme Court of Nevada.

1217 In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

No. 2999.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Stipulation.

It is stipulated and agreed between the parties hereto as follows:

I.

That the motion of Plaintiff heretofore made to file an amendment to its complaint, amending Paragraph VII of said complaint and Paragraph 3 of the Prayer of said complaint may be granted

and said amendments or an engrossed amended complaint embodying said amendments may be filed as of the date of this stipulation:—that the Answer of the Defendant to the original complaint shall be deemed and taken as the Answer to the amended complaint and the replication heretofore filed shall stand as a replication to said Answer; subject to all rights of amendments by permission of the Court.

II.

The title, ownership and right of possession to the ore bodies in dispute shall be first tried and determined by the Court before Plaintiff shall be called upon to introduce evidence as to tonnage and value of ore extracted by Defendant. The issues raised by said amended complaint, answer, and replication shall be tried in the following order:

1218 As by said pleadings it is admitted that Defendant has been carrying on mining operations and extracting ore from underneath the surface of the Eureka and Curtis Mining Claims, owned by the Plaintiff, the Defendant shall proceed to introduce its testimony justifying its right to so mine and extract said ore. Plaintiff shall thereupon introduce its testimony in opposition to Defendant's and Defendant shall thereupon rebut the same. After the evidence has been fully taken in behalf of both parties on the issue as to title, ownership and right of possession, and argument thereon had, such issue shall thereupon be submitted to the Court for its finding and decision.

III.

In the event that the Court finds in favor of Plaintiff on the issue of title, the question of the tonnage and value of the ores claimed to have been extracted by Defendant from underneath the surface of Plaintiff's mining claims and all other matters pertinent to that issue shall be brought on for hearing and trial by the Court by either party upon five days' notice one to the other. Plaintiff first introducing testimony, Defendant to follow, and Plaintiff to close with its rebuttal. In determining the tonnage and value there shall be included all such ores extracted and removed by Defendant underneath the surface of Plaintiff's mining claims prior to the commencement of this action, as may by the Court be determined to have been the property of Plaintiff, and shall also include all ore extracted and removed by Defendant from such property since the commencement of this action, which shall be adjudged to be the property of Plaintiff, and up to and including the date of the trial of such issue of tonnage and value. Upon the determination by the Court of the issue of tonnage and value, findings of fact and conclusions of law, embracing all the issues in the case, shall be signed and filed, and judgment therein shall be entered.

1219 IV.

In the event said Court shall determine said issue of title in favor of Defendant, findings of fact and conclusions of law shall be filed and judgment therein entered.

V.

Nothing in this stipulation contained shall be construed as a waiver on the part of either party of their respective rights to move to vacate or set aside any judgment which may be entered in this action, or the findings and conclusions of law made by the Court; or to apply for a new trial, or to appeal from said judgment or to take any steps in regard thereto as the respective parties may be advised.

VI.

Upon demand made in that behalf by Plaintiff, at any time subsequent to the announcement by the Court of its Decision on the issue of title, if such decision be in favor of Plaintiff, the Defendant will permit Plaintiff, its attorneys and an assistant to be nominated by Plaintiff, to inspect and take copies of all entries in the books of Defendant, relating to the tonnage and value of said ores, and to inspect and take copies of all assay sheets, memoranda of assays, maps, and other data, showing or tending to show the tonnage and value of said ores; and to give to said Plaintiff all information Defendant, its officers, and employees have in reference to said tonnage and values.

1220 VII.

In the event said Court shall determine the issue of title in favor of said Plaintiff, and upon its announcement of such determination, the Court shall forthwith issue and set for hearing an order to show cause herein upon the application for a restraining order and injunction filed herein by Plaintiff on the second day of December, 1914.

Dated at Tonopah, Nevada, December 7th, 1914.

CURTIS H. LINDLEY,
HUGH H. BROWN,
W. E. COLBY,
J. H. EVANS,
Attorneys for Plaintiff.
PECK, BUNKER & COLE,
HORATIO ALLING,
CHENEY, DOWNER, PRICE & HAWKINS,
DICKSON, ELLIS, ELLIS & SCHULDER,
H. H. ATKINSON,
Attorneys for Defendant.

Endorsed: Mark R. Averill, District Judge. Filed Dec. 7, 1914. Robert B. Pohl, Clerk, by Lowell Daniels, Deputy.

A true and correct copy.
H. R. MIGHELS,
Clerk Supreme Court of Nevada.

1220½ [Endorsed:] No. 2999. In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye. Jim Butler Tonopah Mining Company, a Corporation, Plaintiff, vs. West End Consolidated Mining Company, a Corporation, Defendant. Stipulation. Filed Dec. 7, 1914. Robert G. Pohl, Clerk. Endorsed by Mark R. Averill, District Judge.

1221 In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Findings of Fact and Conclusions of Law.

This cause, having been called regularly for trial on the 8th day of December, 1914, before the Court (a jury trial having been expressly waived, as appears from the minutes of this court); and Curtis H. Lindley, Esq., Hugh H. Brown, Esq., W. E. Colby, Esq., and J. H. Evans, Esq., appearing as attorneys for the plaintiff, and Peck, Bunker & Cole, Horatio Alling, Esq., Cheney, Downer, Price & Hawkins, Dickson, Ellis, Ellis & Schulder, and H. H. Atkinson, Esq., appearing for the defendant; and the trial being proceeded with and concluded under and pursuant to a certain stipulation entered into between the respective parties, which said stipulation is as follows, to wit:

1222 In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

No. 2999.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Stipulation.

It is stipulated and agreed between the parties hereto as follows:

I.

That the motion of Plaintiff heretofore made to file an amendment to its complaint, amending Paragraph VII of said complaint

and Paragraph 3 of the Prayer of said complaint may be granted and said amendments or an engrossed amended complaint embodying said amendments may be filed as of the date of this stipulation:—that the Answer of the Defendant to the original complaint shall be deemed and taken as the Answer to the amended complaint and the replication heretofore filed shall stand as a replication to said Answer; subject to all rights of amendments by permission of the Court.

II.

The title, ownership and right of possession to the ore bodies in dispute shall be first tried and determined by the Court before Plaintiff shall be called upon to introduce evidence as to tonnage and value of ore extracted by Defendant. The issues raised by said amended complaint, answer, and replication shall be tried in the following order:

As by said pleadings it is admitted that Defendant has been carrying on mining operations and extracting ore from underneath the surface of the Eureka and Curtis mining Claims, owned by the Plaintiff, the Defendant shall proceed to introduce its testimony justifying its rights to so mine and extract said ore. Plaintiff shall thereupon introduce its testimony in opposition to Defendant's and Defendant shall thereupon rebut the same. After the evidence has been fully taken in behalf of both parties on the issue as to title, ownership and right of possession, and argument thereon had, such issue shall thereupon be submitted to the Court for its finding and decision.

1223

III.

In the event that the Court finds in favor of Plaintiff on the issue of title, the question of the tonnage and value of the ores claimed to have been extracted by Defendant from underneath the surface of Plaintiff's mining claims and all other matters pertinent to that issue shall be brought on for hearing and trial by the Court by either party upon five days' notice one to the other. Plaintiff first introducing testimony, Defendant to follow, and Plaintiff to close with its rebuttal. In determining the tonnage and value there shall be included all such ores extracted and removed by Defendant underneath the surface of Plaintiff's mining claims prior to the commencement of this action, as may by the Court be determined to have been the property of Plaintiff, and shall also include all ore extracted and removed by Defendant from such property since the commencement of this action, which shall be adjudged to be the property of Plaintiff, and up to and including the date of the trial of such issue of tonnage and value, findings of fact and conclusions of law, embracing all the issues in the case, shall be signed and filed, and judgment therein shall be entered.

IV.

In the event said Court shall determine said issue of title in favor

of Defendant, findings of fact and conclusions of law shall be filed and judgment therein entered.

V.

Nothing in this stipulation contained shall be construed as a waiver on the part of either party of their respective rights to move to vacate or set aside any judgment which may be entered in this action, or the findings and conclusions of law made by the Court; or to apply for a new trial, or to appeal from said judgment or to take any steps in regard thereto as the respective parties may be advised.

VI.

Upon demand made in that behalf by Plaintiff, at any time subsequent to the announcement by the Court of its Decision on the issue of title, if such decision be in favor of Plaintiff, the Defendant will permit Plaintiff, its attorneys and an assistant to be nominated by Plaintiff, to inspect and take copies of all entries in the books of Defendant, relating to the tonnage and value of said ores, and to inspect and take copies of all assay sheets, memoranda of assays, maps, and other data, showing or tending to show the tonnage and value of said ores; and to give to said Plaintiff all information Defendant, its officers, and employees have in reference to said tonnage and values.

1224

VII.

In the event that said Court shall determine the issue of title in favor of said Plaintiff, and upon its announcement of such determination, the Court shall forthwith issue and set for hearing an order to show cause herein upon the application for a restraining order and injunction filed herein by Plaintiff on the second day of December, 1914.

Dated at Tonopah, Nevada, December 7th, 1914.

CURTIS H. LINDLEY,
HUGH H. BROWN,
W. E. COLBY,
J. H. EVANS,
Attorneys for Plaintiff.
PECK, BUNKER & COLE,
HORATIO ALLING,
CHENEY, DOWNER, PRICE & HAWKINS,
DICKSON, ELLIS, ELLIS & SCHULDER,
H. H. ATKINSON,
Attorneys for Defendant.

(Endorsed:) Filed Dec. 7, 1914. Robert G. Pohl, Clerk, by Lowell Daniels, Deputy.

and the Court having heard the proofs of the respective parties and considered the same, and the records and papers in the cause,

and the arguments of the respective attorneys thereon, and the cause having been submitted to the Court for its decision, the Court now finds the following facts:

1225 *Findings of Fact.*

I.

That the Plaintiff, Jim Butler Tonopah Mining Company, at all of the times mentioned in the Complaint and the Amended Complaint herein, was, and is now, the owner and in possession of, and entitled to the possession of those certain patented lode mining claims situated, lying and being in the Tonopah Mining District, County of Nye, State of Nevada, known as and called respectively the Eureka lode mining claim and the Curtis lode mining claim; the said Eureka lode mining claim being a portion of United States Survey designated by the United States Surveyor General of the State of Nevada as Survey No. 2600; and the said Curtis lode mining claim being a portion of United States Survey designated by the United States Surveyor General of the State of Nevada as Survey No. 2042.

II.

That the defendant, West End Consolidated Mining Company, is, and it or its predecessors in interest continuously for more than thirteen years last past has been, the owner of, in possession of, and entitled to the possession of that certain lode mining claim situated in the Tonopah Mining District, Nye County, State of Nevada, known as and called the West End lode mining claim, being United States Survey designated by the United States Surveyor General for the State of Nevada as Survey No. 2024; that the Government of the United States, by patent bearing date the 21st day of July, 1904, granted and conveyed said West End mining claim to the defendant's grantor and predecessor in interest, namely, the Tonopah Extension Milling & Mining Company, a corporation; that said mining claim is described in said patent as follows, to wit:

1226 Beginning at Corner No. 1, from which the south corner of Section 35 in Township 3 North of Range 42 Mount Diablo Meridian bears South 2 deg. 12 min. west 1248.6 feet distant.

Thence, first course, south 74 deg. 42 min. West 750 feet to Corner No. 2; 1406.8 feet to Corner No. 3.

Thence, second course, North 11 deg. 20 min. W. 301 feet to Corner No. 4.

Thence, third course, North 5 deg. 31 min. East 313.3 feet to Corner No. 5.

Thence, fourth course, North 74 deg. 6 min. East 749.9 feet to Corner No. 6.

Thence, fifth course, North 74 deg. 42 min. East 608 feet to Corner No. 7.

Thence, sixth course, South 83 deg. 58 min. East 134.5 feet to Corner No. 8.

Thence, seventh course, South 5 deg. 31 min. West. 269.8 feet to a point from which discovery shaft bears South 74 deg. 42 min. West 204.5 feet; 590.7 feet to Corner No. 1, the place of beginning.

That prior to the issuance of said patent a valid discovery was made upon and within said West End Mining Claim, and a vein or lode of rock in place, bearing gold, silver, and other valuable metals was cut by and disclosed in the discovery shaft of said mining claim; that said vein or lode so cut and disclosed in said discovery shaft, at its top or apex, and on its course or strike, crosses the easterly end line of said West End mining claim, and thence, at its top or apex and on its course or strike, continues in a westerly direction within said mining claim, and between the side lines thereof, until it intersects, and at its top or apex and on its course or strike, crosses the northerly side line of said mining claim and so departs therefrom.

III.

That said Eureka lode mining claim adjoins and is contiguous to said West End mining claim upon and along the southerly side line of said West End mining claim, and that said Curtis
1227 lode mining claim adjoins and is contiguous to said Eureka lode mining claim upon and along the southerly side line of said Eureka lode mining claim.

IV.

That there is a vein or lode of rock in place, bearing gold, silver, and other valuable metals, which, at its top or apex, and on its course or strike, crosses the easterly end line of said West End mining claim 130 to 140 feet northerly from the southeasterly corner of said mining claim, and thence, at its top or apex, and on its course or strike, continues westerly in said mining claim between the side lines thereof to a point on the northerly side line of said claim 1142½ feet westerly from the northeast corner of said claim measured along the northerly side line thereof, at which point the said vein, at its top or apex, and on its course or strike, departs from said mining claim, crossing said northerly side line. That said vein dips southerly, and in its downward course so far departs from the perpendicular as to pass beyond the southerly side line of said West End mining claim, extended downward vertically, and thence into and beneath the surface of the said Eureka lode mining claim and the said Curtis lode mining claim of the plaintiff company.

That the defendant is now, and at all of the times mentioned in the Complaint and the Amended Complaint herein, was, the owner of, in possession of, and entitled to the possession of said vein in this finding mentioned and described throughout its entire depth between vertical planes, one drawn through the easterly end line of said West End mining claim continued in its own direction indefinitely southerly, and another drawn parallel thereto through a point on the northerly side line of said mining claim 1142½ feet westerly
1228 from the northeast corner of said mining claim, measured

along the northerly side line thereof, continued indefinitely in its own direction southerly.

The said vein is more particularly described as follows:

The said vein does not on its upward course, or at its top or apex, outcrop or reach the present surface, but is covered or buried to a considerable depth by lava, locally known as and called "Midway" andesite, which, after the formation of the vein, flowed over the then surface of the territory in which the vein exists; that at and for a distance of 360 feet westerly from where said vein or lode crosses the easterly end line of said West End claim, which crossing is at a distance of 135 feet northerly from the southeast corner of said West End claim, there is a juncture or union between two limbs or sides of said vein, and from the summit of said juncture or union the downward course of one limb or side thereof is in a northerly direction, and the downward course of the other limb or side thereof is in a southerly direction; that there is a continuation upward from the summit of said juncture or union of said northerly and southerly dipping limbs or sides of said vein, of ore and silver-bearing quartz or rock in place for a distance from 20 or 30 to more than 100 feet, and to what was the surface before the same was buried beneath the said lava flow; that such ore and silver-bearing quartz were deposited where the same are now found at
the same time and during the same period that the main vein
1229 below was created, and from mineral-bearing solutions having
the same source; that the dip is fairly conformable and the strike or course of such upward continuation of ore and silver-bearing quartz is conformable to the dip and strike or course of the said northerly-dipping limb or side of said vein from the summit of said juncture downward, and the Court finds that said upward continuation is a part of said vein or lode; that thence westerly, and for a distance of 360 feet, the northerly and southerly dipping limbs, sides, or slopes of said vein do not unite or form a union or juncture in their upward course, but for that distance each of said limbs or sides has a separate and independent top or apex; that thence westerly, for a distance of 40 feet, the northerly and southerly dipping limbs, sides, or slopes of said vein are again found in conjunction, as in the said most easterly 360 feet; that thence westerly, and until said northerly and southerly dipping limbs, sides, or slopes of said vein intersect with and cross said northerly side line of said mining claim, they do not unite or form a union or juncture in their upward course, but for that distance each of said limbs or sides has a separate and independent top or apex; that between said distance of 40 feet, where said northerly and southerly dipping limbs, sides, or slopes of said vein, as aforesaid, unite or form a union or juncture in their course upward, and said points on said northerly side line of said mining claim where, as aforesaid, said contra-dipping limbs, sides or slopes of said vein respectively intersect said side line and cross the same and so depart from said mining claim, there are two points at which it appears that said contra-dipping limbs, sides or slopes of said vein on their upward course approach closely to a juncture or union, but as to said contra-dipping limbs, sides, or

slopes of said vein at said two points actually forming a
1230 juncture or union on their upward course, the evidence is meager and unsatisfactory; that the point where the said northerly dipping limb or side of said vein departs from the said mining claim through the northerly side line thereof is 1120 feet westerly from the northeast corner of said claim measured along the northerly side line thereof; that the point where said southerly dipping limb or side of said vein departs from said mining claim through the northerly side line thereof is 1142½ feet westerly from the northeast corner of said claim measured along the northerly side line thereof; that throughout said distance of 40 feet, where the contra-dipping limbs or sides of said vein are found in conjunction, as hereinbefore stated, there is a continuation upward from the summit of the juncture or union of said two limbs or sides of said vein of ore or vein quartz to what was the surface before the same was covered by the lava flow; that the dip or downward course of both the northerly and southerly dipping sides or limbs of the vein where the two are found in conjunction, as aforesaid, and also in the places where each, as aforesaid, has its separate and independent top or apex, is regular and practically free from undulations; that the said southerly dipping limb or side of the vein in the easterly portion of the West End claim, that is to say, the easterly 360 feet thereof, has been developed from the top or summit of said juncture of said contra-dipping limbs to and beyond the southerly side line of said claim, or for a distance, measured on the slope or downward course of said southerly dipping limb or side, of 800 feet or thereabouts, the average dip there being 17 degrees from the horizontal; that the westerly portion, that is to say, the westerly 300 feet of said southerly dipping limb or side of said vein found in the West End claim, has
been developed from its top to and beyond the southerly
1231 side line of said claim, or for a distance, measured on its slope or downward course, of 1000 feet or thereabouts, the average dip there being 30 degrees from the horizontal; that the average dip of said northerly dipping limb or side of said vein, so far as the same has been developed in its downward course, is 17 degrees from the horizontal; that said vein is a fissure vein; that there is a difference in the strikes or courses of said northerly and southerly dipping limbs of said vein of about 40 degrees; that at said places and throughout said distances, where said contra-dipping limbs of said vein are found to intersect and form a juncture, as aforesaid, there has been a mingling of the mineralizations of said two limbs of said vein within the angle beneath the juncture of the said two limbs; that at such places and throughout said distances the footwall of said two limbs of said vein, within the angle beneath their said juncture, by the process of replacement has been converted into mineralized quartz for considerable distances below said juncture, said replacement quartz extending from limb to limb.

That the shaft known as the McQuillan shaft was the discovery shaft of the West End mining claim; that said discovery shaft encountered and disclosed no vein or lode of mineral-bearing rock in place until, in its downward course, it cut and disclosed said north-

erly dipping limb or part of said vein; that said northerly dipping limb of said vein was cut and disclosed in said discovery shaft on the 3rd day of April, 1903.

V.

That all of the ores mentioned in the Complaint and in the Amended Complaint herein, as having been mined, broken down, extracted and removed by the defendant within the surface boundaries extended downward vertically of said Eureka and Curtis
1232 lode mining claims, were mined, broken down, extracted and removed by the defendant from said vein and between the extralateral planes described in the next preceding Finding.

VI.

That all of said ores mention- in the next preceding Finding, so as aforesaid mined, broken down, extracted and removed by the defendant within the surface boundaries of said Eureka and Curtis lode mining claims extended downward vertically were the property of, and were owned by, the said defendant at the time they were so mined, broken down, extracted and removed; that none of the said ores, so as aforesaid mined, broken down, extracted and removed by the defendant within the surface boundaries extended downward vertically of said Eureka and Curtis lode mining claims was, at the time they were so mined, broken down, extracted and removed, or ever was, the property of said plaintiff.

That said plaintiff has not suffered or sustained any damage in any form whatever by reason of any act of the defendant alleged in the Complaint or the Amended Complaint herein.

VII.

That the defendant never threatened to, or intended to, or ever claimed the right to enter upon or under the surface of said Eureka lode mining claim or said Curtis lode mining claim, other than that part or portion thereof included within said vein or lode herein found to have its top or apex within said West End mining claim and which on its downward course passes into and beneath the surface of said Eureka and Curtis lode mining claims; and the defendant never threatened to, or intended to, or ever claimed the right to enter upon or mine or extract ores from said vein from beneath the surface of said Eureka and Curtis lode mining claims other than that part or portion of said vein between vertical planes, one
1233 drawn through the easterly end line of said West End mining claim extended in its own direction indefinitely southerly, and another, parallel thereto, through a point on the northerly side line of said West End mining claim 1142½ feet westerly from the northeast corner of said mining claim, measured along the northerly side line thereof, extended in its own direction indefinitely southerly.

Conclusions of Law.

From the foregoing Findings of Fact the Court makes the following Conclusions of Law:

I.

That at all of the times mentioned in the Complaint and the Amended Complaint herein, the defendant was and now is, the owner of, in possession of, and entitled to the possession of all of the vein from which the ores were taken as alleged in the Complaint and the Amended Complaint herein, and as herein found, between vertical planes, one drawn through the easterly end line of said West End mining claim, continued in its own direction indefinitely southerly, and another, parallel thereto, drawn through a point on the northerly side line of said mining claim, 1142½ feet westerly from the northeasterly corner of said mining claim, measured along the northerly side line thereof, continued in its own direction indefinitely southerly.

II.

That said plaintiff has not suffered or sustained any damage in any form whatever by reason of any act alleged in the Complaint or the Amended Complaint herein.

1234 III.

That said plaintiff is not entitled to take anything by its said action; that the said defendant have and recover from said plaintiff its costs in the sum of —.

IV.

That all restraining orders or interlocutory injunctions heretofore made or issued in said cause upon entry of judgment should be dissolved.

And judgment is hereby ordered entered accordingly.
Dated at Tonopah, Nevada, May 27th, 1915.

MARK R. AVERILL,
Judge of said District Court.

A true and correct copy.
H. R. MIGHELS,
Clerk Supreme Court of Nevada.

Filed May 27, 1915. Robert B. Pohl, Clerk, by Lowell Daniels, Deputy.

1234½ [Endorsed:] In the District Court of the Fifth Judicial District of the State of Nevada, in and for the County of Nye. Jim Butler Tonopah Mining Company, a corporation, Plain-

tiff, vs. West End Consolidated Mining Company, a corporation, Defendant. Findings of Fact and Conclusions of Law. Filed May 27, 1915. Robert B. Pohl, Clerk.

Endorsed: Mark R. Averill, District Judge.

1235 In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,

vs.

WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Judgment.

This action was called regularly for hearing on December 8, 1914, before the Court, a jury trial having been expressly waived by the parties. The plaintiff appeared through Curtis H. Lindley, Esq., Hugh H. Brown, Esq., W. E. Colby, Esq., and J. H. Evans, Esq., its attorneys, and the defendant appeared by Peck, Bunker & Cole, Horatio Alling, Esq., Cheney, Downer, Price & Hawkins, Dickson, Ellis, Ellis & Schulder, and H. H. Atkinson, Esq., its attorneys; and the Court heard the testimony introduced on behalf of the respective parties and reserved the case for argument. That thereafter, on the 8th day of March, 1915, the parties again appeared through the same counsel, and the Court heard the arguments of the attorneys of the respective parties and reserved its decision. That afterwards, on April 30, 1915, the Court filed its decision. That thereafter, and on May 27th, 1915, the Court made and filed its Findings of Fact and Conclusions of Law.

1236 Wherefore, by reason of the law and the premises, as aforesaid, it is ordered, adjudged, and decreed that the plaintiff take nothing by its action in this behalf.

It is further ordered, adjudged, and decreed by the Court that all injunctions and restraining orders heretofore issued in this case be, and the same are, hereby dissolved.

It is further ordered, adjudged, and decreed by the Court that the defendant recover its costs and necessary disbursements incurred in this action in the sum of One Hundred Eighty Nine and 60/100 ($189.60) Dollars.

Done in open court this third day of June, 1915.

MARK R. AVERILL,
Judge of said District Court.

A true & correct copy.
H. R. MIGHELS,
Clerk Supreme Court of Nevada.

Filed June 3, 1915. Robert B. Pohl, Clerk, by Lowell Daniels, Deputy.

1237–1474 In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,

vs.

WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

I, the undersigned, County Clerk of Nye County, State of Nevada, and ex-officio Clerk of the District Court of the Fifth Judicial District of the State of Nevada, in and for the County of Nye, do hereby certify the foregoing to be a true copy of the Judgment entered in the above entitled action, and recorded in Judgment Record D of said Court, at page 337. And I further certify that the foregoing papers, hereto annexed, constitute the Judgment Roll in said action.

Witness my hand and the seal of said Court, this 3rd day of June, A. D. 1915.

[Seal of the Fifth Judicial District Court.]

ROBERT G. POHL, *Clerk*,
By LOWELL DANIELS,
Deputy Clerk.

A true and correct copy.
H. R. MIGHELS,
Clerk Supreme Court of Nevada.

Filed June 3, 1915. Robert B. Pohl, Clerk, by Lowell Daniels, Deputy.

* * * * * * *

1475 In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye.

No. 2999.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Plaintiff,

vs.

WEST END CONSOLIDATED MINING COMPANY, a Corporation, Defendant.

Notice of Appeal from the Judgment and Order Denying Motion for New Trial.

To the West End Consolidated Mining Company, a corporation, defendant in the above-entitled cause, and to its attorneys, Messrs. Peck, Bunker & Cole, Dickson, Ellis, Ellis & Schulder, Cheney, Downer, Price & Hawkins, Horatio Alling and H. H. Atkinson, and to Robert G. Pohl, as clerk of the above-entitled court:

You and each of you will please take notice, and you are hereby notified, That the Plaintiff in the above-entitled action hereby ap-

peals to the Supreme Court of the State of Nevada from the Judgment made and entered in the above-entitled court in said cause on the third day of June, 1915, and from the whole of said Judg-
1476 ment, and also from the Order made and entered by said court on the sixth day of July, 1915, denying Plaintiff's Motion for a New Trial herein.

Dated: August sixth, 1915.

CURTIS H. LINDLEY,
WILLIAM E. COLBY,
HUGH H. BROWN,
J. H. EVANS,
By HUGH H. BROWN.
As Attorneys for Plaintiff.

Filed August 6, 1915. Robert B. Pohl, Clerk, by Lowell Daniels, Deputy.

A true and correct copy.
H. R. MIGHELS,
Clerk Supreme Court of Nevada.

1476½-1482 [Endorsed:] No. 2999. In the District Court of the Fifth Judicial District of the State of Nevada in and for the County of Nye. Jim Butler Tonopah Mining Company, a corporation, Plaintiff, vs. West End Consolidated Mines Company, a corporation, Defendant. Notice of appeal from the judgment and order denying motion for new trial. Filed August 6, 1915. Robert B. Pohl, Clerk, by Lowell Daniels, Deputy. Curtis H. Lindley, William E. Colby, Hugh H. Brown, J. H. Evans, Attorneys for the Plaintiff. 312-316 State Bank and Trust Co. Building, Tonopah, Nevada.

* * * * * * *

1483 In the Supreme Court of the State of Nevada.

No. 2195.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Appellant,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Respondent.

Curtis H. Lindley, William E. Colby, Hugh H. Brown, J. H. Evans, Attorneys for Appellant.

Peck, Bunker & Cole, Dickson, Ellis, Ellis & Schulder, Cheney, Downer, Price & Hawkins, Horatio Alling, H. H. Atkinson, Attorneys for Respondent.

Statement of the Case.

This is an action brought by the appellant, the Jim Butler Tonopah Mining Company, against the respondent, the West End Con-

solidated Mining Company, to recover damages for ore ex-
1484 tracted by the respondent and situated vertically beneath the surface of the Eureka and Curtis lode mining claims owned by appellant, and also for an injunction restraining the defendant from committing further trespass.

The respondent owns the adjoining West End lode mining claim, and asserts the right to mine extralaterally on the vein and ore bodies in dispute by virtue of the ownership of this claim, which it contends embraces the apex of the vein, so situated with reference to the boundaries of the claim that it can avail itself of the extralateral grant contained in the federal mining statutes.

The court found, among other facts, the following:

"That there is a vein or lode of rock in place, which, at its top or apex, and on its course or strike, crosses the easterly end line of said West End mining claim 130 to 140 feet northerly from the southeasterly corner of said mining claim, and thence, at its top or apex, and on its course or strike, continues westerly in said mining claim between the side lines thereof to a point on the northerly side line of said claim 1142½ feet westerly from the northeast corner of said claim, at which point the said vein, at its top or apex, and on its course or strike, departs from said mining claim, crossing said northerly side line. That said vein dips southerly, and in its downward course so far departs from the perpendicular as to pass beyond the southerly side line of said West End mining claim, extended downward vertically, and thence into and beneath the surface of the said Eureka lode mining claim and the said Curtis lode mining claim of the plaintiff company.

The said vein does not on its upward course, or at its top or apex, outcrop or reach the present surface, but is covered or buried to a considerable depth by lava, locally known as and called "Midway" andesite, which, after the formation of the vein, flowed over the then surface of the territory in which the vein exists; that at and for a distance of 360 feet westerly from where said vein or lode crosses the easterly end line of said West End claim, which crossing is at a distance of 135 feet northerly from the southeast corner of said West End claim, there is a juncture or union between two limbs or sides of said vein, and from the summit of said juncture or union the downward course of one limb or side thereof is in a northerly direction, and the downward course of the other limb or side
1485 thereof is in a southerly direction; that there is a continuation upward from the summit of said juncture or union of said northerly and southerly dipping limbs or sides of said vein, of ore and silver-bearing quartz or rock in place for a distance from 20 or 30 to more than 100 feet, and to what was the surface before the same was buried beneath the said lava flow; that such ore and silver-bearing quartz were deposited where the same are now found at the same time and during the same period that the main vein below was created, and from mineral bearing solutions having the same source; that the dip is fairly conformable and strike or course of such upward continuation of ore and silver-bearing quartz is conformable to the dip and strike or course of said northerly-dipping limb or side of

said vein from the summit of said juncture downward, and the Court finds that said upward continuation is a part of said vein or lode; that thence westerly, and for a distance of 360 feet, the northerly and southerly dipping limbs, sides, or slopes of said vein do not unite or form a union or juncture in their upward course, but for that distance each of said limbs or sides has a separate and independent top or apex; that thence westerly for a distance of 40 feet, the northerly and southerly dipping limbs, sides, or slopes of said vein are again found in conjunction, as in the said most easterly 360 feet; that thence westerly, and until said northerly and southerly dipping limbs, sides, or slopes of said vein intersect with and cross said northerly side line of said mining claim, they do not unite or form a union or juncture in their upward course, but for that distance each of said limbs or sides has a separate and independent top or apex; that between said distance of 40 feet, where said northerly and southerly dipping limbs, sides, or slopes of said vein, as aforesaid, unite or form a union or juncture in their course upward, and said points on said northerly side line of said mining claim where, as aforesaid, said contra-dipping limbs, sides or slopes of said vein respectively intersect said side line and cross the same and so depart from said mining claim, there are two points at which it appears that said contra-dipping limbs, sides or slopes of said vein on their upward course approach closely to a juncture or union, but as to said contra-dipping limbs, sides, or slopes of said vein at said two points actually forming a juncture or union on their upward course, the evidence is meager and unsatisfactory; that the point where the said northerly dipping limb or side of said vein departs from the said mining claim through the northerly side line thereof is 1120 feet westerly from the northeast corner of said claim measured along the northerly side line thereof; that the point where said southerly dipping limb or side of said vein departs from said mining claim through the northerly side line thereof is 1142½ feet westerly from the
1486 northeast corner of said claim measured along the northerly side line thereof; that throughout said distance of 40 feet, where the contra-dipping limbs or sides of said vein are found in conjunction, as hereinbefore stated, there is a continuation upward from the summit of the juncture of union of said two limbs or sides of said vein of ore or vein quartz to what was the surface before the same was covered by the lava flow; that the dip or downward course of both the northerly and southerly dipping sides or limbs of the vein where the two are found in conjunction, as aforesaid, and also in the places where each, as aforesaid, has its separate and independent top or apex, is regular and practically free from undulations; that the said southerly dipping limb or side of the vein in the easterly portion of the West End claim, that is to say, the easterly 360 feet thereof, has been developed from the top or summit of said juncture of said contra-dipping limbs to and beyond the southerly side line of said claim, or for a distance, measured on the slope or downward course of said southerly dipping limb or side, of 800 feet or thereabouts, the average dip there being 17 degrees from the horizontal; that the westerly portion, that is to say, the westerly 300 feet of said

southerly dipping limb or side of said vein found in the West End claim, has been developed from its top to and beyond the southerly side line of said claim, or for a distance, measured on its slope or downward course, of 1,000 feet or thereabouts, the average dip there being 30 degrees from the horizontal; that the average dip of said northerly dipping limb or side of said vein, so far as the same has been developed in its downward course, is 17 degrees from the horizontal; that said vein is a fissure vein; that there is a difference in the strikes or courses of said northerly and southerly dipping limbs of said vein of about 40 degrees; that at said places and throughout said distances, where said contra-dipping limbs of said vein are found to intersect and form a juncture, as aforesaid, there has been a mingling of the mineralizations of said two limbs of said vein within the angle beneath the juncture of the said two limbs; that at such places and throughout said distances the footwall of said two limbs of said vein, within the angle beneath their said juncture, by the process of replacement has been converted into mineralized quartz for considerable distances below said juncture, said replacement quartz extending from limb to limb."

Appellant bases its appeal from the decision of the trial court on the following grounds:

"A. Erroneous Findings of Fact.

"1. That the finding of the trial court that the two sides of Northerly and Southerly dippings slopes of the single vein
1487 involved are not united at the crest of the anticlinal roll, but are separated for considerable distances within the West End claim, thus forming separate terminal edges along the upper edges of each of these stopes, is unsupported by the evidence.

"2. That the finding of the trial court giving the occurrences of quartz in the 'A' series of raises the dignity of a vein is not justified by the evidence, and further, that no matter what may be its character, it admittedly dips to the North and has no bearing on a claimed extralateral right extending to the South.

"B. Errors of Law.

"1. The trial court found that the discovery in the West End claim was on the Northerly dipping portion or slope of the vein, and in spite of this finding awarded an extralateral right to appellee on the Southerly dipping limb or slope of the vein. Appellant contends that this is an erroneous construction of the federal statute granting the right to follow a vein extralaterally, and that extralateral rights in two opposite directions attaching to the same mining claim, and the same vein, are not contemplated by this statute.

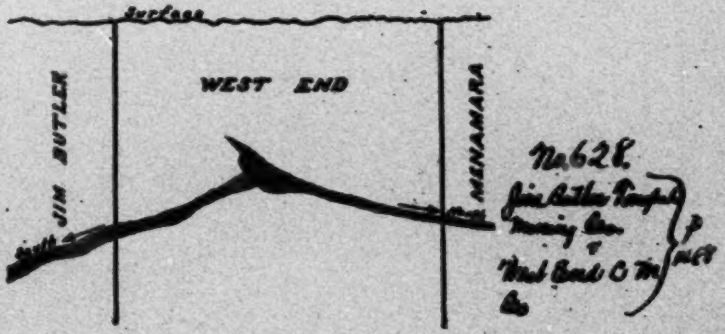
"2. The trial court found that the Northerly and Southerly dipping limbs or sides of the vein were united and joined at the crest of the roll for a considerable distance within the West End claim. Appellant contends that the court should have denied the appellee the right to follow the vein extralaterally where such a condition

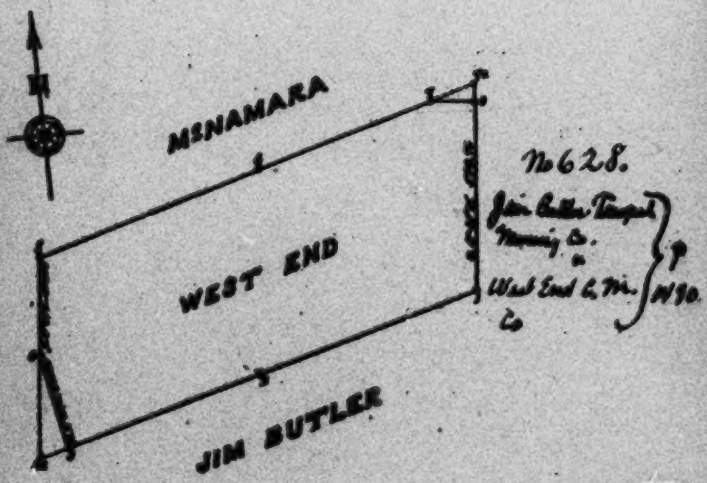
exists and that no extralateral right whatsoever attaches to an anticlinal occurrence in a vein since the latter does not constitute an apex within the meaning of the federal mining statute.

"3. The Westerly end line of the West End claim is a broken line. Appellant contends that no extralateral right whatsoever may be exercised under such circumstances since such right attaches only to mining claims possessing straight end lines."

1487½ The following diagram represents a cross section of the vein where the two limbs have been shown by development work to be united at the crest of the anticlinal fold.

(Here follows diagram marked p. 1488.)


Surface
JIM BUTLER
WEST END
MENAMARA
No 628.


N
MENAMARA
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JIM BUTLER
No 628.
Jas. Butler Tempest
Mining Co.
West End G. Mi. Co.
No 90

1489 *Opinion.*

By the Court, NORCROSS, *C. J.*:

This case presents two main questions of law, to-wit:

First. Whether the fact that the westerly end line of the surface area of the West End claim as patented, being not a straight, but a broken line, in and of itself deprives the owner of that claim of extralateral rights upon any vein apexing therein.

Second. Whether, within the meaning of the Act of Congress, the crest or crown of a vein which is found in the form of a single anticline may be regarded as the top or apex of the vein, and extralateral rights exist upon such vein in opposite directions.

The answer to these questions must be found in an interpretation of that portion of the mining act which contains the grant of extralateral rights and which reads as follows:

"The locators of all mining locations * * * shall have the exclusive right of possession and enjoyment of all the surface included within the lines of their locations, and of all veins, lodes, and ledges throughout their entire depth the top or apex of which lies inside of such surface lines extended downward vertically, although such veins, lodes, or ledges may so far depart from a perpendicular in their course downward as to extend outside the vertical side lines of such surface locations. But their right of possession to such outside parts of such veins or ledges shall be confined to such portions thereof as lie between vertical planes drawn downward as above described, through the end lines of their locations, so continued in their own direction that such planes will intersect such exterior parts of such veins or ledges. And nothing in this section shall authorize the locator or possessor of a vein or lode which extends in its downward course beyond the vertical lines of his claim to enter upon the surface of a claim owned or possessed by another. (Section 2322, U. S. Rev. Stats.)"

1489½ The following diagram shows the relative position of the surface boundaries of the patented West End location:

[Here follows diagram marked p. 1490.]

The location would embrace a full claim 1500′ by 600′ excepting for the excluded area embraced within the two triangles 3, 3*a*, 4 and 7, 7*a*, 8. The lines 4, 5, and 1, 8 are parallel. While the plat and field notes, accompanying application for the patent, are not in the record, it is probable that they would disclose that the surface boundaries of the claim as located would include the two triangular pieces of ground above mentioned, and that the same were excluded from the patent application *eb*cause in conflict with prior existing locations. In every great mining district locations are made from time to time in every direction and a map of such a district presents a confusing mass of conflicting boundaries. In locating a claim the locator may lay his lines upon or across portions of prior
1491 existing claims in order to secure parallelism of end lines and thus secure to himself extralateral rights. Del Monte Case, 171 U. S. 55.

While a locator, prior to patent as well as after patent, may have no greater extent of extralateral rights than the extent of the vein within the boundaries of his surface rights, (2 Lindley, Sec. 574), he may, prior to patent, have his extralateral rights determined by planes parallel to planes passing through his located end lines, even though one or both of such located end lines are upon the surface ground of contiguous prior claims owned by other parties. This is the rule of the Del Monte and other cases. What reason, then, can exist in support of a proposition that because such owner obtained a patent for his claim he must forfeit extralateral rights because in his application for patent he excludes areas in conflict with prior claims, resulting in patented surface boundaries of irregular shape. There is, it seems to us, no reason why such a thing should be. Certainly the securing of a patent to a location ought not to leave a locator with less rights than he had before. That the mining laws are to be liberally construed in favor of the locator is a proposition now too well settled to need a citation of authorities. To hold that simply because the boundaries of the surface of a patented claim are so irregular in shape as not to present parallel end lines, dues to exclusions of conflicts, extralateral rights are lost, is to place upon the statute a construction contrary to its purpose as that purpose has frequently been enunciated. Lawson v. U. S. M. Co., 207 U. S. 1; 2 Lindley, Sec. 584.

1492 Even if this is a more liberal construction of the statute than is warranted, which we think it is not, nevertheless, so far as this particular case is concerned, it can not, we think, be said that the patented surface area of the West End claim does not present parallel end lines. The end lines 1, 8 and 4, 5 are each part of the original located end lines. They should, we think, still be considered end lines and the true end lines of the patented claim. To so hold requires that the line 3, 4 be regarded as a side line rather than as a part of a so-called broken end line. We think it should be so regarded. Side lines are not required to be parallel. No rule can well be applied governing courses and distances of side lines other than that they shall not be so laid as to increase the statutory width or length of a claim. The line 1, 8 is conceded to be an end line. But

if the line 4, 5 is not also an end line but rather a part of a broken end line, it is drawing a rather fine distinction to say that the lines 3, 4 and 4, 5 are parts of a broken end line and that the lines 7, 8 and 8, 1 are not. The difference is only in the degree of the angle and the length of the lines—a difference which has no reasonable basis upon which to support a distinction.

We think the ruling that the line 4, 5 is the westerly end line of the West End claim finds support in both reason and authority. Walrath v. Champion M. Co., 171 U. S. 293.

We come now to a consideration of the question whether extralateral rights exist upon a vein in the form of a single anticlinal fold. It is the contention of counsel for appellant that such rights do not exist for the reason, among others alleged, that the federal statute does not contemplate extralateral rights in opposite
1493 directions. It is the contention that only veins dipping in the same direction as the discovery vein may be followed extralaterally; that where within the same location a secondary vein is found dipping in the opposite direction as that of the discovery vein extralateral right thereon cannot be enjoyed. We think the statute is not susceptible of this construction. The statute gives to the locators—

"the exclusive right, possession and enjoyment of all the surface included within the lines of their locations and of all veins, lodes and ledges throughout their entire depth, the tops or apexes of which lie inside of such surface lines * * * although such veins, lodes or ledges may so far depart from the perpendicular in their course as to extend outside the vertical side lines of such surface locations."

Congress manifestly contemplated that the locator of a mining claim might discover more than one vein within his surface boundaries and provided that he should have "all veins, lodes and ledges, throughout their entire depth." But it is contended that the concluding portion of the section limiting extralateral rights between "vertical planes drawn downward * * * through the end lines * * * so continued in their own direction" negatives an intent to permit extralateral rights in opposite directions because the words "in their own direction" relate to but one direction, that of the dip of the discovery vein. We are unable to see the force of this contention. The direction of an end line depends upon which end of the line it is viewed from. The courses given in a patent of the two end lines of a claim usually, and doubtless invariably, are in opposite directions. It would be a strained construction and one, we think, not within the letter or spirit of the statute, to hold that end lines may be considered as having but one direction.
1493½ If a vein in the form of a single anticlinal fold may be said to have an apex, we think there is nothing in the statute which militates against extralateral rights upon such vein in opposite directions the same as though it were two veins with separate apices, instead of one vein.

The most serious question presented in this case is whether the vein in question may be said to have an apex. The vein is in the

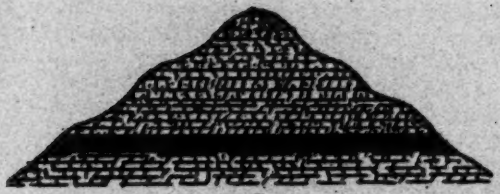
form of a single anticlinal fold and the precise question presented by a vein in such form appears never, heretofore, to have been determined.

Counsel for appellant, in their brief, say:

"The definition of the term 'apex' as employed in the mining statute involves the elements of terminal edge of a vein and downward course extending therefrom. According to this definition, the horizontal sheet '*a*' on figure 3 here inserted, and the anticlinal fold '*b*' have no apices, while the synclinal fold '*c*' has two apices."

* * *

(Here follow diagrams marked p. 1494.)

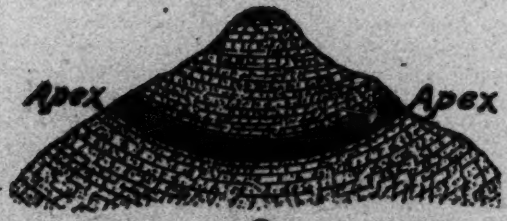


a

#628.

Jim Butler Pumpernickel Mining Co. in West End O. Mo. Co.

b



c

It is apparent that no extralateral rights could attach to a horizontal vein, as represented in sheet "a," because such vein has no "course downward" as prescribed in the statute. Such a vein has a top, if not an apex, in the strict sense of that word, and will support a valid location. Why a synclinal fold should be said to have
1495 two apices and an anticlinal fold have none, is not so easy to find a reason for unless we accept as conclusive appellant's contention that a terminal edge is essential to a true definition of the word "apex" as used in the statute. The words "terminal edge" are not used in the statute, nor have they been of universal use in defining an apex. The great majority of veins have terminal edges and in all such cases the apex of the vein is its terminal edge. If veins in the form of a single anticlinal roll were the rule rather than the rare exception, we are of the opinion that a contention that a terminal edge was essential to an apex would be as rare as the character of the vein now in question. It has been repeatedly said by courts and text writers that the words "top" and "apex" were not a part of the miner's terminology prior to the adoption of the federal mining statutes. They were words used by legislators to convey the intent of the framers of the statute. There is no controversy regarding the general purpose and intent of the mining statutes. The government as a matter of public policy was interested in the development of the mining resources of the nation. It offered to the prospector and miner the most liberal reward for his enterprise in discovering and developing the hidden treasures of the earth. It gave him the exclusive possession of the surface of every valid location made, placed no limit upon the number of such locations; gave him all veins, lodes and ledges throughout their entire depth, the top or apex of which were within his surface lines; it exacted no price for the land as a condition precedent to mining operations; and placed no restrictions upon him that were not consistent with the public purpose,
1496 such as requiring a minimum of annual labor as an evidence of good faith. To say that a miner fortunate enough to discover a valuable vein in the form of a single anticline shall not have extralateral rights upon each limb of his vein because, forsooth, the summit or crest of the anticlinal fold does not present a terminal edge as is the case of the ordinary form of a fissure vein, in our opinion, would do violence to the spirit, if not the very letter, of the statute. The well settled policy of the courts is to construe the statutes liberally in the interest of the miner. It has been determined that if the locator by inadvertence places his location crosswise instead of lengthwise of his vein he does not lose his extralateral rights but his side lines will be regarded as end lines and vice versa. So too, if his vein crosses an end and a side line, he will be given a new side line for purposes of determining the extent of his extralateral rights. So too, in the matter of discovery, the first essential to a valid location, the extreme liberality of the courts has been manifested in hundreds of cases.

If a locator finds his surface boundaries embrace the apices of two or more valuable veins, he is simply fortunate the same as the locator whose single ledge is more valuable than the one of his neigh-

bor. The statute makes no distinction between rights of locators based upon the value of the discoveries. Such distinctions are not within the policy of the statute.

The only difference between a vein in the form of a single anticlinal fold and the ordinary fissure vein is that the former has a crest, the limbs of which dip in opposite directions, while the latter has a terminal edge and a drop in but one direction. But this distinction presents no difference such as would violate the pur-
1497 pose of the statute if the crest of the former, like the terminal edge of the latter, should be held to constitute an apex.

The distinguished counsel for appellant in his great work on Mines, says:

"In the light of the rules announced in the previous articles, if a given mineral deposit is in place, it is a lode. The law assumes that the lode has a top, or apex, and provides for the acquisition of title by location upon this apex. A lode without an apex is not contemplated and no provision is made for locating it. It cannot be located under the placer laws, because these laws apply only to deposits not in place, and before it can be legally located as a lode, the apex, or top, must be found. If a location is made on the side or on the dip, whoever discovers and properly locates the apex will be entitled to enjoy the full rights accorded to regular valid lode locations, and the rights of those who have located on the side edge, or dip, must yield.

The most serious difficulty in defining the apex has arisen in connection with certain flat, or 'blanket' deposits, which have been judicially determined to be lodes within the meaning of the statutes. It is often quite impracticable to fix upon any exposure of such a deposit which properly constitutes the apex. It is true that after a lode patent is issued, the existence of an apex within the patented ground will be conclusively presumed, but not necessarily the apex of the vein in dispute. Nor will it be conclusively presumed that any particular exposure of the vein is that apex. It must still remain a question of proof." (Lindley on Mines, Vol. 1, 3rd Ed., Sec. 305.)

Can it be said with reason that a vein in the form of a single anticlinal fold was not intended to be the subject of a location within the meaning of the mining statutes because it does not possess a terminal edge? It is conceded that it is a vein or lode and it is well settled that it is one. "All valuable mineral deposits * * * are * * * free and open to exploration and purchase," is the language of the statute. (Rev. Stats., U. S., Sec. 2319.) The federal statutes clearly contemplated that the vein in question was subject to location, for it made no exclusions of veins of any particular character. If a vein without an apex is not contemplated and no
1498 provisions made for locating it, as the distinguished author says, then it follows as a necessary conclusion that the vein in controversy has an apex. If it has an apex, there is no other possible place for it to be than at the crest of the anticlinal fold.

It is contended, however, that the Supreme Court of the United States is committed to the view that a terminal edge is essential to an apex of a vein or lode, and the recent case of Stewart Mining Company v. Ontario Mining Company, 237 U. S. 350, is cited in support

of this contention. In that case, Mr. Justice McKenna, speaking for the Court, said:

"An apex is, on cited authority, defined to be 'all that portion of the terminal edge of a vein from which the vein has extension downward in the direction of the dip.' And it is further said that the definition has been approved in Lindley on Mines, because as therein expressed it 'involves the elements of terminal edge, and downward course therefrom.' We may accept the definition. In its application, however, it immediately encounters a question of fact—the locality of the terminal edge; and in this case the state courts did not find it to be where plaintiff asserted it to be."

The court in the Stewart-Ontario case did "accept the definition" of apex to be the terminal edge of the vein. The vein in controversy in that case had a terminal edge and there was no occasion to consider whether the definition given was comprehensive. The Idaho Court, from which the case reviewed, on error, had determined that that which the Stewart Company claimed was an apex was only the side of the vein where the vein on its strike was cut off by a fault. The Idaho Court was sustained. See same case, 23 Idaho 724, 132 Pac. 787 and Stewart M. Co. v. Bourne, 218 Fed. 327.

1499 As said by Chief Justice Marshall, in the celebrated case of Cohen vs. Virginia, 6 Wheat., at p. 399:

"It is a maxim not to be disregarded that general expressions in every opinion are to be taken in connection with the case in which those expressions are used. If they go beyond the case, they may be respected, but ought not to control a judgment in a subsequent suit when the very point is presented for decision. The reason of this maxim is obvious. The question actually before the court is investigated with care and considered in its full extent. Other principles which may serve to illustrate it are considered in their relation to the case decided, but their possible bearing on all other cases is seldom completely investigated."

This maxim has been reiterated times almost without number. It is applicable to the Stewart-Ontario decision. The definition was sufficient for the question involved in that case, otherwise we may assume the question would have been given more consideration than the laconic sentence—"We may accept the definition."

Judge Hawley, in Book v. Justice Mining Co., 58 Fed., at p. 121, in reference to the definition of a vein or lode, said:

"Various courts have at different times given a definition of what constitutes a vein, or lode, within the meaning of the Act of Congress; but the definitions that have been given, as a general rule, apply to the peculiar character and formation of the ore deposits, or vein matter," etc.

The Idaho Court, in the Stewart-Ontario case, supra, at p. 737, speaks of the definition of the word "apex" as follows:

"The definition of the word 'apex' as used in the statute (sec. 2322, U. S. Rev. Stats.) all reach the one inevitable conclusion that it is the highest point in the vein (Flagstaff Silver Min. Co. v. Tarbet, 98 U. S. 469, 25 L. ed. 253, 9 Morr. Min. Rep. 607; Lindley on Mines, 2d ed., secs. 305, 309; Costigan on Mining Laws, p. 137, sec.

35; Duggan v. Davey, 4 Dak. 110, 26 N. W. 887, 17 Morr.
1500 Min. Rep. 59; Del Monte Min. Co. v. Last Chance Min. Co.,
171 U. S. 55, 18 Sup. Ct. 895, 43 L. ed. 72, 19 Morr. Min. Rep. 370), but this is only a general definition, and its application to any particular vein or peculiar location may and often will call for further particularity of description. It must be the top or terminal edge of the vein on the surface or the nearest point to the surface, spur or feeder, just as the highest point in the roof of a house would be taken to be the apex of the house, and not the chimney or flagstaff. Again, an apex is a point from which the vein has a dip as well as strike or course else it confers no extralateral right."

Where a vein has a terminal edge its apex is a point from which, or a line along which, is its strike and from which it has a dip, but this is equally true of the crest of a vein in the form of a single anticlinal fold.

Counsel for appellant quote the following definitions from text writers in support of the terminal edge theory:

"Conceiving a vein or lode to be an intrusive sheet of mineralized matter of varying thickness found in the mass of the mountain, the apex of a vein is thus seen to be that edge of the sheet which shows on the surface of the location, or is nearest to the surface. It is not a point, though apex naturally suggests point. It is not a line, though it has the full extension of the upper edge of the lode. It is the whole surface of the upper edge of the vein, with all the width and length which that edge has." Costigan on Mining Law, 139-140.

"The mere fact that proximity to the surface is insufficient to establish the apex without the evidence that it is the upper edge or end of the vein." Barringer and Adams, The Law of Mines and Mining, p. 442.

"In the mathematical sense, an apex means the highest point; but it is not used in this sense in the statute. As used therein it means the edge or termination of the vein which comes to the surface of the earth, forming an outcrop, or which comes nearest to the surface of the earth when the vein terminates before it reaches the surface. * * * It may not be the highest point of a vein, as such highest point may be found in a swell of the vein." Shamel-Mining, Mineral & Geological Law, 193, 197.

1501 "The top or apex of a vein or lode is the highest point thereof and may be at the surface of the ground or at any point below the surface; the end or edge of a vein nearest the surface." Mines & Minerals, 27 Cyc., 537.

"The end or edge of a vein nearest the surface." Raymond—Glossary of Mining and Metallurgical Terms. Trans. Am. Inst. M. E., Vol. IX, p. 102.

It is quite manifest, we think, that all the definitions quoted are considering the ordinary form of vein. Definitions given by text writers are usually based on court decisions, and like such decisions are to be considered with reference to the facts upon which they are based.

From section 306 of Lindley on Mines, we quote:

"Webster defines an apex to be 'the top, point, or summit of anything.'

Compilers of dictionaries which have made their appearance since the act under consideration was passed have not been particularly lucid in their definitions. For instance:

Standard Dictionary:—

(1) The pointed or angular end, or highest point, as of a pyramid, spire, or mountain; extreme point; tip; top.

(2) The vertex of a plane or solid angle.

(3) The highest point of a stratum; as a coal seam.

Century Dictionary:—

(1) The tip, point, or summit of anything. In geometry, the angular point of a cone or conic section. The angular point of a triangle opposite the base.

(2) In geology, the top of an anticlinal fold of strata. This term, as used in United States Revised Statutes, has been the occasion of much litigation. It is supposed to mean something nearly equivalent to outcrop; but precisely in what it differs from outcrop has not been, neither does it seem capable of being, distinctly made out.

Evidently the courts even now can receive but little assistance from the lexicographers."

It appears, however, that the Century Dictionary, in an effort to give a comprehensive definition, regards "the top of an anti-
1502 clinal fold of strata" as an apex.

Counsel for appellant, in their brief, say:

"Probably the most interesting and instructive of all the adjudicated cases is the pioneer case of Duggan v. Davey, 4 Dak. 110, 26 N. W. 887. The decision of the Supreme Court of Dakota follows, in the main, the opinion given by the trial court. It is a lucid and masterly presentation of the law, and while an anticlinal roll was not there involved, several expressions of the court are well worth quoting in support of our contention that a terminal end or edge of a vein is an essential element of apex definition.

'The definition of the top or apex of a vein usually given is "the end or edge of a vein nearest the surface"; * * * Justice Goddard, a jurist of experience in mining law, in his charge to the jury in the case of Iron Silver v. Louisville, defines "top" or "apex" as the highest or terminal point of a vein "where it approaches nearest the surface of the earth and where it is broken on its edge, so as to appear to be the beginning or end of the vein" * * *' "

Some expressions of the court used just prior to the language last quoted are instructive:

"The definition of the top or apex of a vein usually given is: 'the end or edge of a vein nearest the surface:' and to this definition the defendants insist we must adhere with absolute literal and exclusive strictness, so that wherever, under any circumstances, an edge of a vein can be found at any surface, regardless of all other circumstances that is to be considered as the top or apex of the vein. * * * The definition given is no doubt correct under most circumstances, but, like many other definitions, is found to lack fullness and ac-

curacy in special cases; and I do not think important questions of law are to be determined by a slavish adherence to this letter of an arbitrary definition. It is indeed difficult to see how any serious question could have arisen as to the practical meaning of the terms 'top' or 'apex,' but it seems in fact to have become somewhat clouded. I apprehend if any intelligent person were asked to point out the top or apex of a house, a spire, a tree, or hill, he would have no difficulty in doing so, and I do not see why the same common sense should not be applied to a vein or lode."

1503 In the Duggan v. Davey case, the question was whether an exposed side of a vein caused by erosion or some other agency, upon which locations were made, constituted the apex of the vein. The question was substantially the same as that involved in the Stewart-Ontario case, supra. The same contention appears to have been made in this case based upon the fact that the westerly portion of the vein within the West End claim, by some titanic eruption of the earth's surface, had been cut off leaving a sharply defined but irregular broken edge.

The case of Illinois S. M. Co. v. Raff, 7 N. M. 336, 34 Pac. 544, is cited by counsel for appellant as "a case possessing many points of similarity to the case at bar." In that case the court said:

"We can recognize the definition of a vein as given by Judge Hallett in Hyman v. Wheeler, 15 Mor. 519, and still see that the jury in this cause might from the evidence have determined that here was a vast bed, lode, zone, or mass of mineral-bearing lime, with no foot wall and, in some localities, with no hanging wall or even cap,—in others covered with shale, the lime body extending throughout the Illinois, the Calamity, the Andy Johnson, Brush Heap, and locations west and south of the Illinois, as well as possibly other mines.

That this body or mass, zone, or lode of lime was broken or cut up into fissures, gashes, pockets, veins, etc., and these spaces filled with mineral, * * * in fact, we might accept either of the theories advanced by geologists and mineralogists as to the formation of the rock or deposit of mineral, and there would yet be nothing to prevent our reconciling that theory with the verdict of the jury in this cause, that there was neither a vein nor an apex upon the Illinois mine, or at least such a vein as could be followed beyond the side lines of that claim.

There may be a contact, and yet no contact vein. The mineral may be exposed, at a point upon one claim and followed continuously under the surface from this point to another property, though an undisputed vein between clearly defined hanging and foot walls, and still the point at which the mineral is exposed not be the apex of the vein which may have an apex ten miles distant, or may have no apex at all.

1504 * * * The zone or mass may follow the undulations of a broken country down into the valley and rising over the divides, cutting through, covered by or overlapping other formations, but until it is broken and the edges exposed or some edge or end as a beginning point found from which it can be followed down at some

angle below the horizontal, there is no apex from which it can be followed beyond the side lines of a claim located upon it."

The facts before the New Mexico Court were so different from those of the case at bar, that we think the case affords little aid in determining the question here.

Our attention has been directed to definitions of the word "apex," given in instructions to juries by Judge Hallett in the case of Iron Silver M. Co. v. Murphy, 3 Fed. 368, and by Justice Miller in the case of Stevens v. Williams, Fed. Cas. No. 13,413, both cases growing out of the peculiarities of the Leadville ore deposits. Referring to the character of these ore deposits, Lindley at Sec. 300 says:

"The blanket deposits at and in the vicinity of Leadville, Colorado, have given rise to most of the controverted questions on the subject of 'lodes,' 'veins,' 'in place,' 'top,' and 'apex'; and the burden of solving many of these difficulties in the first instance fell to the lot of Judge Hallett. His decisions have furnished the text for other courts, in other jurisdictions, where analogous conditions have been to a limited extent encountered."

Again in Sec. 311, the author says:

"As in almost all other phases of the mining law, the flat deposits of Leadville have produced their full quota of adjudicated law on the subject of 'tops' and 'apices.' As these deposits are legally held to be veins, or lodes, of rock in place, subject to mineral location, the law contemplated that they should have apices."

The section includes a number of figures illustrative of the Leadville formation, none of which present any similarity to the vein in controversy here.

Justice Miller instructed the jury relative to the facts in the Stevens case, supra, among other matters, as follows:

1505 "The top or apex of a vein, within the meaning of the act of Congress, is the highest point of that vein where it approaches nearest to the surface of the earth, and where it is broken on its edge so as to appear to be the beginning or end of the vein. The word 'outcrop' has been used in connection with it. * * *; it means the nearest point at which it is found toward the surface of the earth. And where it ceases to continue in the direction of the surface, is the top or apex of that vein. It is said in this case that the point claimed to be the top or apex is not such, because at the points where the plaintiff shows or attempts to prove an interruption of that vein, in its ascent towards the surface, and what he calls the beginning of it, the defendants say that is only a wave or roll of the general shoot of the metal, and that from that point it turns over and pursues its course downwards as a part of the same vein, in a westerly or southwesterly direction. It is proper I should say to you, if the defendants' hypothesis be true, if that point which the plaintiff calls the 'highest point,' the 'apex' is merely a swell in the mineral matter, and that it turns over and goes on down in a declination to the west, that it is not a true apex within the statute. It does, not mean merely the highest point in a continuous succession of rolls or waves in the elevations and depressions of the mineral nearly horizontal."

We have here a very different state of facts than were involved

in the Leadville cases. In those cases the court was dealing with a mineral formation nearly horizontal or varied by a series of anticlinal and synclinal rolls. Here we have a vein in the form of a single anticline.

The Land Commission created by the act of Congress of March 3, 1879, sought and obtained, among other matters, many definitions of the word "apex" as used in the mining statutes. Many of these definitions are embodied in Sec. 307 of Lindley. Relative to these definitions, the author says:

1506 "Judge Beatty, then chief justice of Nevada, gave the clearest and most comprehensive of all the definitions. It is as follows:

The top, or apex, of any part of a vein is found by following the line of its dip up to the highest point at which vein-matter exists in the fissure. According to this definition, the top, or apex, of a vein is the highest part of the vein along its entire course. If the vein is supposed to be divided into sections by vertical planes of right angles to its strike, the top, or apex, of each section is the highest part of the vein between the planes that bound that section. * * *

Of course, there are irregular mineral deposits departing widely in their characteristics from the typical or ideal vein which seems to have been in the mind of the framer of the act of 1872. To such deposits the foregoing definitions will not apply; and, in my opinion, great difficulty will be experienced in any attempt to apply the existing law to them."

If we apply the definition of Judge Beatty to the vein here involved, and follow the line of the dip of either or both limbs of the anticline to the highest point, we come to the crest. There is nothing in this definition which militates against the crest of the anticlinal roll being the apex of the vein unless it is assumed or conceded that a vein can have but a dip in one direction.

There can be and there is no question in this case but that the so-called West End-McNamara vein was subject to location. If it be true, and we assume that it is, that the law contemplates that every vein has an apex, (Lindley, Secs. 305, 311), then it necessarily follows, we think, that the crest of the anticlinal roll is the apex. Certainly by no process of reasoning can it be said that the apex lies in either Jim Butler or McNamara ground, except as the crest of the

anticline may be in McNamara territory after it corsses the northerly ende line of the West End claim.

The judgment is affirmed.

NORCROSS, *C. J.*

We concur:
McCARRAN, *J.*
COLEMAN, *J.*

Attest:
A true and verified copy.
H. R. MIGHELS, *Clerk.*

Attest:
A full, true and correct copy.
JOHN E. RICHARDS,
Official Reporter.

1506½ [Endorsed:] No. 2195. In the Supreme Court of the State of Nevada. Jim Butler Tonopah Mining Company, a corporation, appellant, vs. West End Consolidated Mining Company, respondent. Opinion by Norcross, C. J. Filed July 3, 1916, H. R. Mighels, Clerk, by —— ——, Deputy.

1507 In the Supreme Court of the State of Nevada.

No. 2195.

JIM BUTLER TONOPAH MINING COMPANY, a Corporation, Appellant,
vs.
WEST END CONSOLIDATED MINING COMPANY, a Corporation, Respondent.

Judgment.

This cause having been heretofore heard, submitted, and taken under advisement by the court, and the court having fully considered the same, now on this day the decision of the court is delivered by Chief Justice Norcross, to the effect that the judgment of the trial court be affirmed.

It is, therefore, considered, adjudged and decreed by the court that the judgment of the Fifth Judicial District Court of the State of Nevada, in and for the County of Nye, in the above entitled cause, be and the same hereby is affirmed, with costs in favor of respondent.

[Seal, Supreme Court, State of Nevada.]

H. R. MIGHELS,
Clerk Supreme Court, State of Nevada.

Dated this 3rd day of July, 1916.

1508 In the Supreme Court of the State of Nevada.

No. 2195.

JIM BUTLER TONOPAH MINING COMPANY (a Corporation), Appellant,
vs.
WEST END CONSOLIDATED MINING COMPANY (a Corporation), Respondent.

Order.

Heretofore an Order was made and filed herein under date July seventh, 1916, giving the Appellant thirty days in addition to the time allowed by law, within which to file a petition for rehearing herein.

Good cause appearing therefor, it is hereby ordered that the said Order of July seventh, 1916, extending the time of Appellant to file petition for rehearing herein, be, and the same is hereby, withdrawn, canceled and annulled; and *if* further appearing that the Appellant has declared in open court that the Appellant does not intend to file a petition for rehearing herein, and will not file such petition, therefore, it is ordered that the time within which such petition might be filed is hereby shortened and shall expire on July 31st, 1916.

Dated: August first, 1916.

F. H. NORCROSS,
Chief Justice.

Attest:
H. R. MIGHELS,
Clerk Supreme Court, State of Nevada.

1509 In the Supreme Court of the State of Nevada.

No. 2195.

JIM BUTLER TONOPAH MINING COMPANY (a Corporation), Appellant,
vs.
WEST END CONSOLIDATED MINING COMPANY, (a Corporation), Respondent.

Petition for Writ of Error.

To the Honorable F. H. Norcross, Chief Justice of the Supreme Court of the State of Nevada:

The petition of the Jim Butler Tonopah Mining Company, a corporation existing under the laws of the State of Delaware, respectfully shows:—

That on the 3rd day of July, 1916, the Supreme Court of the State

a rendered a final judgment against your petitioner in a rein your petitioner was appellant, and the West End Con- Mining Company, a corporation, was respondent, affirming nent of the District Court of the Fifth Judicial District of of Nevada, in and for Nye County, in said cause, and that eme Court of the State of Nevada is the highest court in said which a decision can be had.

That as appears from the record in said cause, your peti- ner is, and at all times mentioned in the pleadings in this use has been the owner and entitled to the possession of two tented lode mining claims situated in the Tonopah Mining Nye County, Nevada, known as and called respectively the nd Curtis mining claims. That said respondent was the a certain patented lode mining claim known as and called End mining claim, which adjoins the patented claims of on the North.

ner appears from said record that the title to the respective claimed by the respective parties, became vested in the re- arties or their grantors by virtue of patents issued by the tates under the provisions of Title XXXII, Chapter Six, Statutes of the United States.

her appears from said record that prior to the commence- aid action the Respondent had entered upon and under- surface of Appellant's Eureka and Curtis Lode Claims, and acted and removed, and was, when said action was com- engaged in extracting and removing ore and valuable min- from. Said action was brought by appellant to determine ship of the vein and the ore therein underneath the surface l claims, and to recover damages from Respondent for the and removal of said ore.

The Respondent in its answer claimed the ownership of the e bodies in dispute by reason of the alleged existence within e boundaries of its West End claim of the top or apex of the tuated within the boundaries as to confer upon Respondent to pursue the vein on its downward course underneath the f the Appellant's Eureka and Curtis claims.

ant controverted this asserted extralateral right by assert- the vein in question was in the form of an anticlinal vein, o top or apex or terminal edge within Respondent's claim, ted that under its patent for the Eureka and Curtis claims, r the provisions of Title XXXII, Chapter Six, of the Re- tutes of the United States, Appellant was the owner of the s in dispute.

ial court found as a fact that as claimed by Appellant said anticlinal in form, with two limbs descending into the earth te directions, but further held and decided that as a matter he crest or axis of the anticlinal vein constituted the top or he vein within the meaning of Section 2322 of the Revised of the United States.

ant further contended and claimed that said Respondent entitled to follow said vein underneath the surface of its

Eureka and Curtis claims, because the end lines of said West End claim were not parallel, as required by Section 2322 of the Revised Statutes of the United States, but that the west end boundary
1512 of said claim was broken and consisted of two lines having different directions. Appellant therefore asserted before said trial court that it was the owner of the vein in dispute underneath the surface of its Eureka and Curtis claims.

The trial court overruled the several contentions and claims so made and urged by Appellant, and awarded judgment in favor of Respondent.

An appeal was taken by the Appellant to the Supreme Court of the State of Nevada, and on said appeal Appellant made the same claims and contentions as were made by it in the trial court, that is to say, that Appellant in said last named court urged and claimed that by reason of the fact that the vein was anticlinal in form, and had no top or apex within said West End mining claim, and that the crest or axis of an anticlinal vein was not the top or apex of the vein, within the intent and meaning of Section 2322 of the Revised Statutes of the United States, and that therefore Appellant was the owner of the vein underneath the surface of its Eureka and Curtis claims, under its patent to said claims issued pursuant to Title XXXII, Chapter Six, of the Revised Statutes, and that Respondent had no right or title thereto.

Appellant further set up and claimed in said Supreme Court of Nevada that by reason of the fact that the end lines of said West End claim were not parallel, as required by Section 2322 of the Revised Statutes of the United States, but one of them was broken and consisted of two lines having different directions, the Respondent
1513 was not entitled to follow said vein downward into and underneath the surface of Appellant's said Eureka and Curtis claims, and that Appellant was the owner of the vein underneath the surface of said claims under its patents to said claims, and under the provisions of Title XXXII, Chapter Six, of the Revised Statutes of the United States.

Said Supreme Court of the State of Nevada overruled all the contentions of Appellant and entered a judgment on July 3rd, 1916, affirming the judgment of the trial court.

Said Supreme Court of Nevada in entering said judgment held and decided that the vein in controversy was a single anticlinal vein, the axis or crest of said anticline being within the boundaries of the West End claim of Respondent; that said axis or crest of said anticline constituted in law the top or apex of said vein within the meaning of Section 2322 of the Revised Statutes of the United States, and that Respondent had a right to follow said vein in both directions downward from the axis or crest of said anticline, the Southerly limb of which extended into and underneath the surface of Appellant's Eureka and Curtis claims, by which decision and holding Appellant was deprived of a right accruing to it under and by virtue of its patents to said claims and under and by virtue of the provisions of Title XXXII, Chapter Six, of the Revised Statutes of the United

States, to-wit, the ownership of said vein underneath the surface of said Eureka and Curtis claims.

1514 Said Supreme Court of the State of Nevada further held and decided that although the end lines of Respondent's West End claim were not parallel throughout, and the west end boundary of said claim was a broken line consisting of two parts having different directions, said Respondent was entitled to follow said vein on its downward course into and underneath the surface of Appellant's Eureka and Curtis claims, by which decision and ruling Appellant was deprived of a right accruing to it under and by virtue of its patents to said claims, and under and by virtue of the provisions of Title XXXII, Chapter Six, of the Revised Statutes of the United States, to-wit, the ownership of said vein underneath the surface of said Eureka and Curtis claims.

The Federal questions involved in said cause, and which were necessarily considered by both the trial and appellate court, and which were raised at all stages of the case in both of said courts, are thus stated by the Supreme Court of Nevada in its decision and judgment in said cause:

"This case presents two main questions of law:

First. Whether the fact that the westerly end line of the surface area of the West End claim as patented, being not straight, but a broken line, in and of itself deprives the owner of that claim of extra-lateral rights upon any vein apexing therein.

Second. Whether within the meaning of the Act of Congress, the crest or crown of a vein which is found in the form of a single anticline may be regarded as the top or apex of the vein, and extra-lateral rights exist upon such vein in opposite directions.

The answer to these questions must be found in an interpretation of that portion of the Mining Act, which contains the grant of extra-lateral rights * * *."

1515 Comes now the aforesaid Jim Butler Tonopah Mining Company, Appellant herein, by its attorneys, Curtis H. Lindley and Hugh H. Brown, and petitions this Honorable Court for an order allowing said Appellant to prosecute a writ of error herein to the Honorable Supreme Court of the United States, under and in accordance with the laws of the United States in that behalf made and provided.

Also, that an order be made fixing the amount of security which the Appellant herein shall give upon said writ, as required by the laws of the United States and by the rules of the Supreme Court of the United States, and in fixing the amount of such security so to be given by Appellant, the giving heretofore of the undertaking on appeal staying the execution under the laws of the State of Nevada, be taken into consideration, and that Appellant be allowed the full benefit of said existing bond now in force, securing the Respondent for the payment of the full amount of any judgment which may be awarded to it by the affirmance of said judgment, in whole or any part thereof.

And that such other and further order be made relative to said security to Respondent as may be meet in the premises, to the end

that the granting of the said writ of error and the making of said order as to such security, and the compliance of the terms of said order by Appellant, shall operate as a supersedeas in said action, and that in the giving of such security all further proceedings in
1516 the District Court of the Fifth Judicial District of the State of Nevada, in and for Nye County, and in the Supreme Court of the State of Nevada, be suspended and stayed until the determination of said cause upon said writ of error by the Supreme Court of the United States.

CURTIS H. LINDLEY,
HUGH H. BROWN,
Attorneys for Petitioner.

Writ of error allowed upon the execution of a bond by Jim Butler Tonopah Mining Company in the sum of Two Thousand Dollars; said bond when approved to act as a supersedeas.
Dated August 1st, 1916.

F. H. NORCROSS,
Chief Justice of the Supreme Court of Nevada.

Attest:
H. R. MIGHELS,
Clerk Supreme Court, State of Nevada.

1516½ [Endorsed:] No. 2195. In the Supreme Court of the State of Nevada. Jim Butler Tonopah Mining Company, a corporation, Appellant, vs. West End Consolidated Mining Company, a corporation, Respondent. Petition for Writ of Error. Filed August 1, 1916. H. R. Mighels, Clerk. Curtis H. Lindley, 604 Mills Building, San Francisco, California, and Hugh H. Brown, Tonopah, Nevada, Attorneys for Appellant.

1517 In the Supreme Court of the State of Nevada.

JIM BUTLER TONOPAH MINING COMPANY (a Corporation), Appellant,
vs.
WEST END CONSOLIDATED MINING COMPANY (a Corporation), Respondent.

Assignment of Errors.

Comes now the Jim Butler Tonopah Mining Company, a corporation, Appellant in the above-entitled cause, by its counsel, and files the following assignment of errors upon which it will rely upon its prosecution of the writ of error in the above-entitled cause.

And in this behalf Appellant respectfully represents that the Supreme Court of the State of Nevada erred in its decision and judgment in said cause, as manifestly appears from the record therein, and that the errors so committed by said court are as follows:

I.

The said Court erred in holding and deciding that the crest or axis of the anticlinal vein in controversy in this action con-
1518 stituted in law such a top or apex of the vein within the meaning and intent of Section 2322 of the Revised Statutes of the United States, as conferred upon the Respondent a right to follow said vein and extract and remove the ore therefrom underneath the surface and within the vertical boundaries of Appellant's patented mining claims, the Eureka and Curtis.

II.

The said Court having found and decided that the vein, the ownership of which is in controversy in this action, commonly called the West End-MacNamara Vein, was a single vein underlying the properties of both Appellant and Respondent, that such vein was in the form of an anticline or anticlinal fold, one of the limbs descending into the earth in a Northerly direction, the other in a Southerly direction, the Defendant's discovery and discovery shaft in the West End claim being situated on the Northerly dipping limb of said anticlinal vein, the said Court erred in holding and deciding that the Defendant had a right to follow said vein on the downward course of the Southerly dipping limb into and underneath the surface of the Eureka and Curtis patented claims of Appellant.

III.

The said Court erred in holding and deciding that under Section 2322 of the Revised Statutes of the United States, the words "top or apex" of a vein, as contained in said section, does not require that the vein should have a terminal edge within the bounda-
1519 ries of a claim, in order to entitle the owner of the claim to follow the vein on its downward course into lands adjoining, and said Court erred in holding and deciding that the crest or axis of an anticlinal vein constituted the top or apex of a vein within the meaning of said Section 2322 of the Revised Statutes of the United States.

IV.

The said Court having found and decided that the vein, the ownership of which is in controversy in this action, commonly called the West End-MacNamara Vein, was a single vein underlying the properties of both Appellant and Respondent, that such vein was in the form of an anticline or anticlinal fold, one of the limbs of which descended into the earth in a northerly direction, and the other in a southerly direction, and that said vein had no terminal edge within the boundaries of Respondent's West End claim, the said Court erred in holding and deciding that the defendant had a right to follow said vein on its downward courses in opposite directions,

to-wit, in a Northerly and Southerly direction from the crest or axis of the anticlinal vein.

V.

The Court erred in holding and deciding that the owner of a lode mining claim having therein the tops or apexes of two veins descending into the earth in opposite directions, may follow both veins on their opposite downward courses into and underneath the
1519½ lands adjoining, and the Court further erred in holding and deciding that the same rule should apply, and which the said Court by its holding and decision applied to the single anticlinal West End Vein, having its axis or crest within Respondent's West End claim.

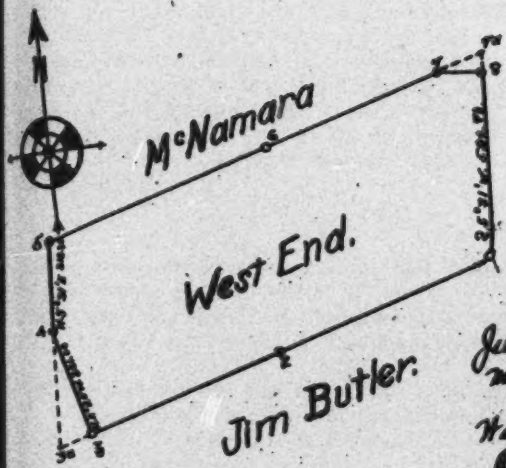
VI.

The said Court erred in holding and deciding that the Respondent was the owner and entitled to the possession of that part of the anticlinal vein commonly known as the West End-MacNamara Vein, which lies underneath the surface and within the vertical boundaries of Appellant's patented Eureka and Curtis claims.

VII.

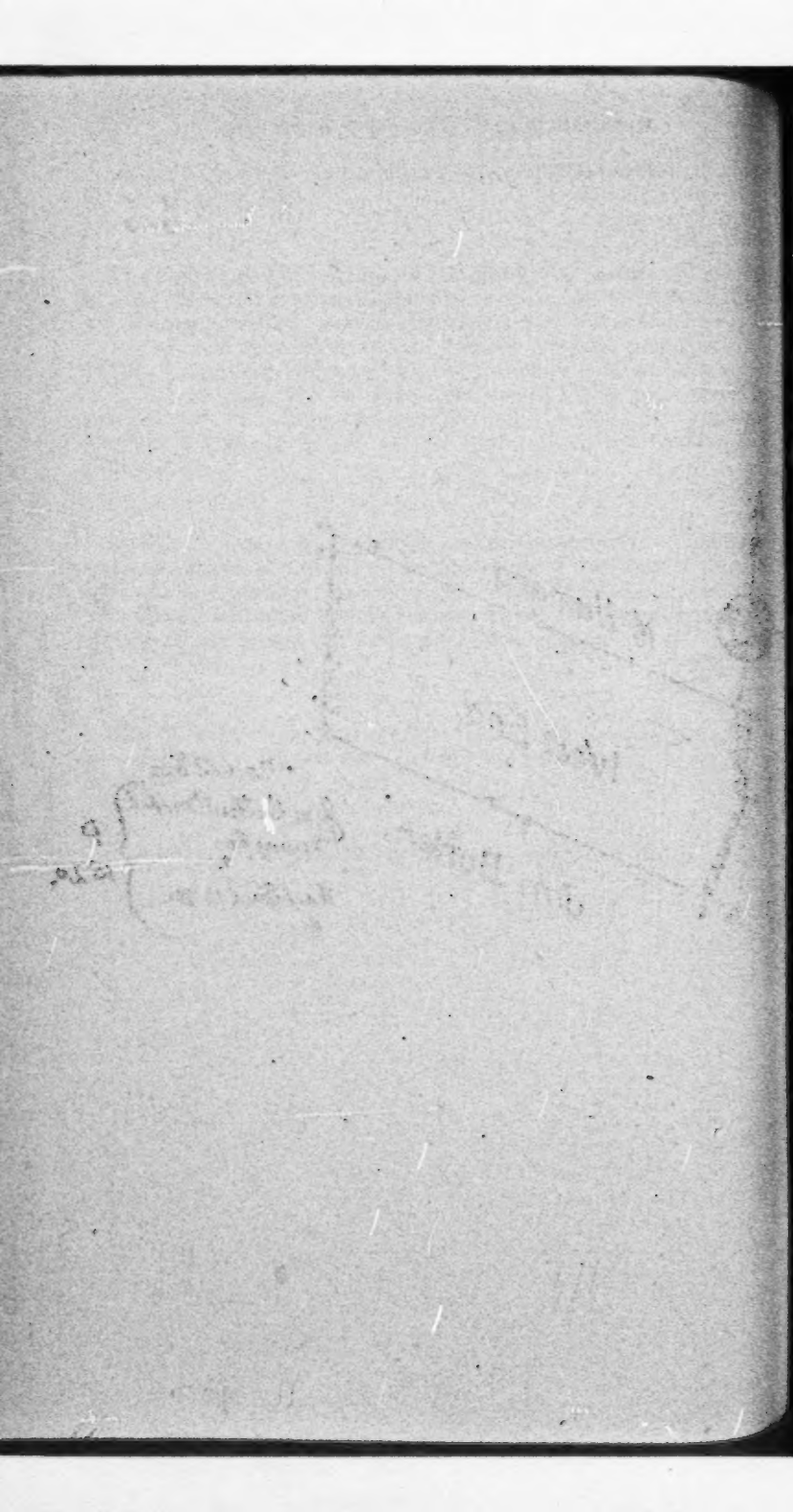
The Court in its decision presented a diagram showing the exterior boundaries of the West End claim, which diagram is herewith reproduced.

(Here follows diagram marked p. 1520.)



No 628.

Jim Butler Mnfg. Co. }
Mining Co. } P
West End C. M. Co. } 1520.



1521 The Court held and decided that the line 1-8 on said diagram and the line 4-5 were the legal end lines of the claim, and that the line 4-3 was a side line. The court erred in holding and deciding that said lines 1-8 and 4-5 were the legal end lines of said claim, and also erred in holding and deciding that said line 4-3 was a side line.

VIII.

The Court erred in holding and deciding that under Section 2322 of the Revised Statutes of the United States, end lines need not be parallel throughout, and that if one end line is straight and the other broken, one being parallel to the other for a part of the distance only and then changing its direction, that the true end lines of the claim are the parallel parts of said end boundaries, and the other lines are side lines, and the Court erred in holding and deciding that the Respondent was entitled to follow the vein in controversy on its downward course into and underneath the surface of Appellant's patented Eureka and Curtis claims, between planes drawn through the lines marked 1-8 and 4-5 on the diagram set forth under assignment VII and such planes extended indefinitely in their own direction Southerly.

IX.

The said Court erred in holding and deciding that Appellant was not the owner of that portion of the vein in controversy which lies underneath the surface and between the vertical boundaries of the Eureka and Curtis patented claims of Appellant.

1522 Wherefore, the Appellant, Jim Butler Tonopah Mining Company, prays that for the errors aforesaid appearing in the record of the Supreme Court of Nevada in said cause to its prejudice, the said judgment and decision may be reversed.

CURTIS H. LINDLEY,
HUGH H. BROWN,
Attorneys for said Jim Butler Tonopah Mining Company.

1522½ [Endorsed:] No. 2195. In the Supreme Court of the State of Nevada. Jim Butler Tonopah Mining Company, a corporation, Appellant, vs. West End Consolidated Mining Company, a corporation, Respondent. Assignment of Errors. Filed August 1, 1916. H. R. Mighels, Clerk. Curtis H. Lindley, 604 Mills Building, San Francisco, California, and Hugh H. Brown, Tonopah, Nevada, Attorneys for Appellant.

1523 In the Supreme Court of the State of Nevada.

JIM BUTLER TONOPAH MINING COMPANY (a Corporation), Appellant,

vs.

WEST END CONSOLIDATED MINING COMPANY (a Corporation), Respondent.

Bond.

Know all men by these presents:

That we, Jim Butler Tonopah Mining Company, a corporation, as principal, and United States Fidelity & Guaranty Company, as surety, are held and firmly bound unto West End Consolidated Mining Company, a corporation, in the sum of Two Thousand and no/100 Dollars, lawful money of the United States, to be paid unto the said obligee, its successors and assigns, for which payment well and truly to be made, we bind ourselves and each of our successors and assigns jointly and severally by these presents.

Dated this 1st day of August, 1916.

Whereas, lately, at a session of the Supreme Court of the State of Nevada, in a suit pending in said Court between Jim
1524 Butler Tonopah Mining Company, Appellant, and West End Consolidated Mining Company, Respondent, a final judgment was rendered against the said Jim Butler Tonopah Mining Company, Appellant, and the said Jim Butler Tonopah Mining Company having obtained the allowance of a writ of error and filed a copy thereof in the Clerk's office of the said Court, to reverse the judgment in the aforesaid suit, and a citation directed to the said West End Consolidated Mining Company, citing and admonishing it to be and appear at the Supreme Court of the United State at Washington within sixty days from the date thereof;

Now the condition of the above obligation is such, that if the said Jim Butler Tonopah Mining Company shall prosecute said writ of error to effect and answer all damages and costs if it fails to make its plea good, then the above obligation to be void; otherwise to remain in full force and virtue.

JIM BUTLER TONOPAH MINING COMPANY,
By CHARLES DUCHENEAU,
As Its Auditor and Attorney in Fact,
By HUGH H. BROWN, *As Its General Counsel.*
UNITED STATES FIDELITY & GUARANTY COMPANY,
By R. J. HIGHLAND.

Signed and Delivered in the presence of
E. A. KEENAN.

Approved, to operate as a supersedeas, by,
F. H. NORCROSS,
Chief Justice of the Supreme Court of the State of Nevada.

Attest:
H. R. MIGHELS,
Clerk Supreme Court, State of Nevada.

1524½ [Endorsed:] 2195. In the Supreme Court of the State of Nevada. Jim Butler Tonopah Mining Company, a Corporation, Appellant, vs. West End Consolidated Mining Company, a Corporation, Respondent. Bond. Filed August 1, 1916. H. R. Mighels, Clerk. Curtis H. Lindley, 604 Mills Building, San Francisco, California and Hugh H. Brown, Tonopah, Nevada, Attorneys for Appellant.

1525 *Writ of Error.*

UNITED STATES OF AMERICA, *ss:*

The President of the United States of America to the Honorable the Justices of the Supreme Court of the State of Nevada, Greeting:

Because in the record and proceedings, and also in the rendition of the judgment of a plea which is in the Supreme Court of the State of Nevada before you, or some of you, being the highest court of law or equity of the said State in which a decision could be had in an action or suit between the Jim Butler Tonopah Mining Company, a corporation, Plaintiff and Appellant, and West End Consolidated Mining Company, a corporation, Defendant and Respondent, wherein rights, privileges and immunities are claimed under the Statutes of the United States, and the decision was against the rights, privileges and immunities specially set up and claimed under such statutes, a manifest error hath happened, to the great damage of the said Jim Butler Tonopah Mining Company, as by its complaint appears, and we being willing that the error, if any there hath been, should be duly corrected, and full and speedy justice done to the parties aforesaid in this behalf, you are hereby commanded, if judgment be therein given, that then, under your seal, distinctly and openly, you send the record and proceedings aforesaid, with all things concerning the same, to the Supreme Court of the United States, together with this writ, so that you have the same at Washington on the 30th day of September,
1526 1916, in the said Supreme Court of the United States, to be there and then held, that the record and proceedings aforesaid *be* inspected, the said Supreme Court of the United States may cause further to be done therein to correct that error, what of right and according to the laws and customs of the United States should be done.

Witness the Hon. Edward D. White, Chief Justice of the United States, this 1st day of August in the year of our Lord one thousand nine hundred and sixteen.

[Seal District Court, District of Nevada.]

T. J. EDWARDS,
Clerk of the United States District Court
for the District of Nevada,
By H. D. EDWARDS, *Deputy.*

The above writ of error is hereby allowed.

F. H. NORCROSS,
Chief Justice of the Supreme Court of the State of Nevada.

Attest:

[Seal Supreme Court, State of Nevada.]

H. R. MIGHELS,
Clerk Supreme Court, State of Nevada.

1526½ [Endorsed:] No. 2195. Writ of Error. To the Honorable the Justices of the Supreme Court of the State of Nevada, in the Case of Jim Butler Tonopah Mining Company against West End Consolidated Mining Company. Lodged August 2, 1916. H. R. Mighels, Clerk.

1527 *Citation.*

UNITED STATES OF AMERICA, *ss:*

To the West End Consolidated Mining Company, Greeting:

You are hereby cited and admonished to be and appear at the Supreme Court of the United States at Washington, D. C., within sixty days from the date hereof, pursuant to a writ of error filed in the office of the Clerk of the Supreme Court of the State of Nevada, wherein the Jim Butler Tonopah Mining Company is plaintiff in error and you are defendant in error, to show cause, if any there be, why the judgment rendered against the said plaintiff in error, as in the said writ of error mentioned, should not be corrected, and why speedy justice should not be done to the parties in that behalf.

Witness the Hon. F. H. Norcross, Chief Justice of the Supreme Court of the State of Nevada this 1st day of August 1916.

F. H. NORCROSS,
Chief Justice of the Supreme Court of the State of Nevada.

Attest:

[Seal Supreme Court, State of Nevada.]

H. R. MIGHELS,
Clerk of the Supreme Court of the State of Nevada.

Service of the foregoing citation admitted and receipt of copy thereof acknowledged this 2nd day of August, 1916.

PECK, BUNKER & COLE,
DICKSON, ELLIS, ELLIS & SCHULDER,
CHENEY, DOWNER, PRICE & HAWKINS,
H. H. ATKINSON,
Attorneys for West End Consolidated Mining Company, Defendant in Error.

1527½ [Endorsed:] No. 2195. In the Supreme Court of the State of Nevada. Jim Butler Tonopah Mining Company,

a Corporation, Appellant, vs. West End Consolidated Mining Company, a Corporation, Respondent. Citation to West End Consolidated Mining Company. Filed August 2, 1916. H. R. Mighels, Clerk. Curtis H. Lindley, 604 Mills Building, San Francisco, California and Hugh H. Brown, Tonopah, Nevada, Attorneys for Appellant.

1528 In the Supreme Court of the State of Nevada.

No. 2195.

JIM BUTLER TONOPAH MINING COMPANY (a Corporation), Appellant,

vs.

WEST END CONSOLIDATED MINING COMPANY (a Corporation), Respondent.

Certificate of Lodgment.

I, H. R. Mighels, Clerk of the Supreme Court of the State of Nevada, do hereby certify that on the 1st day of August, 1916, the original of the foregoing supersedeas bond was lodged with me, as such clerk, and the following endorsement made thereon:

"Filed August 1, 1916. H. R. Mighels, Clerk."

I also certify that the original of the foregoing writ of error was lodged with me, as the clerk of said court, on the 2nd day of August, 1916, and the following endorsement made upon the said original writ: "Lodged August 2, 1916, H. R. Mighels, Clerk." A copy thereof also was lodged for said West End Consolidated Mining Company.

In witness whereof, I have hereunto set my hand and affixed the seal of the Court this 2nd day of August, 1916.

[Seal Supreme Court, State of Nevada.]

H. R. MIGHELS,
Clerk of the Supreme Court of the State of Nevada.

1528½ [Endorsed:] 2195. In the Supreme Court of the State of Nevada. Jim Butler Tonopah Mining Company, (a Corporation), Appellant, vs. West End Consolidated Mining Company, (a Corporation), Respondent. Certificate of Lodgment. Filed August 1, 1916. H. R. Mighels, Clerk. Hugh H. Brown, J. H. Evans, Attorneys at Law, 312-316 State Bank and Trust Co. Building, Tonopah, Nevada.

1529 In the Supreme Court of the State of Nevada.

JIM BUTLER TONOPAH MINING COMPANY (a Corporation),
Appellant,
vs.
WEST END CONSOLIDATED MINING COMPANY (a Corporation),
Respondent.

Order for Transmission of Exhibits to Clerk of the Supreme Court of United States.

On motion of the attorneys for Appellant,

It is ordered that in addition to the transcript of the record on appeal in this action, the Clerk of the Court certify and transmit to the Clerk of the Supreme Court of the United States the exhibits, maps, and models in said cause, to be by him safely kept and returned to this Court on the final determination of said cause in said Supreme Court.

Dated this 1st day of August, 1916.

F. H. NORCROSS,
Chief Justice.

1529½ [Endorsed:] 2195. In the Supreme Court of the State of Nevada. Jim Butler Tonopah Mining Company, a Corporation, Appellant, vs. West End Consolidated Mining Company, a Corporation, Respondent. Order for Transmission of Exhibits to the Clerk of the Supreme Court of the United States. Filed August 2, 1916. H. R. Mighels, Clerk. Curtis H. Lindley, 604 Mills Building, San Francisco, California and Hugh H. Brown, Tonopah, Nevada, Attorneys for Appellant.

1530 In the Supreme Court of the State of Nevada.

JIM BUTLER TONOPAH MINING COMPANY (a Corporation),
Appellant,
vs.
WEST END CONSOLIDATED MINING COMPANY (a Corporation),
Respondent.

Præcipe.

To the Clerk of the above entitled court:

You will please prepare transcript of the record of the cause above entitled, to be filed in the office of the Clerk of the Supreme Court of the United States, pursuant to the command of the writ of error issued in said cause, and you will please identify and certify, for transmission to the Clerk of the Supreme Court of the United States with said transcript, the exhibits in said cause. Said transcript to consist of a copy of the record on appeal in said cause, the opinion of the Supreme Court of the State of Nevada, the petition for writ of

error, assignments of error, order with reference to certification and transmission of exhibits, maps and models, and bond on writ of error to Supreme Court of the United States.

You will also transmit in connection with said papers to the
1531 Clerk of the Supreme Court of the United States the original writ of error and original citation.

Dated this 2nd day of August, 1916.

CURTIS H. LINDLEY,
HUGH H. BROWN,
Attorneys for Appellant.

Service admitted Aug. 2, 1916.
PECK, BUNKER & COLE.
DICKSON, ELLIS, ELLIS & SCHULDER.
CHENEY, DOWNER, PRICE & HAWKINS.
H. H. ATKINSON.

1531½ [Endorsed:] No. 2195. In the Supreme Court of the State of Nevada. Jim Butler Tonopah Mining Company, a corporation, appellant, vs. West End Consolidated Mining Company, a corporation, respondent. Præcipe. Filed August 2, 1916. H. R. Mighels, Clerk. Curtis H. Lindley, 604 Mills Building, San Francisco, California, and Hugh H. Brown, Tonopah, Nevada, Attorneys for Appellant.

1532 In the Supreme Court of the State of Nevada.

No. —.

JIM BUTLER TONOPAH MINING COMPANY (a Corporation),
Appellant,
vs.
Respondent.
WEST END CONSOLIDATED MINING COMPANY (a Corporation),

Clerk's Certificate.

I, H. R. Mighels, Clerk of the Supreme Court of the State of Nevada, do hereby certify that the foregoing, from page one to page 1540 inclusive, is a complete and true transcript of the record and proceedings in the case of Jim Butler Tonopah Mining Company, a corporation, Appellant, versus West End Consolidated Mining Company, a corporation, Respondent, with the exception of the exhibits introduced in evidence in said cause and referred to in said transcript, as appears from the papers and record in said cause on file in my office; that there is also included in said transcript a true and complete copy of the Opinion of the Supreme Court of the State of Nevada in said cause and of the Petition of the Appellant above-named for the Writ of Error annexed hereto and of the Assignment of Errors filed in connection with said Petition.

I further certify that pursuant to an Order of the Chief Justice of

the Supreme Court of the State of Nevada the exhibits in said
1533 cause, consisting of models, maps, and other things, are identified by me and certified separately for transmission with this transcript, to the office of the Clerk of the Supreme Court of the United States in Washington, D. C.

I also certify that there is attached to said transcript the Writ of Error and Citation issued in said cause, which, together with the said transcript and exhibits, are to be transmitted to the Supreme Court of the United States in obedience to the command of said Writ of Error.

Witness my hand and the seal of said Court this 7th day of August, 1916.

[Seal Supreme Court, State of Nevada.]

H. R. MIGHELS,
Clerk of the Supreme Court of the State of Nevada.

[United States internal revenue documentary stamp, series of 1914, ten cents, canceled 8/8/1916. H. R. M.]

1534 In the Supreme Court of the State of Nevada.

No. —.

JIM BUTLER TONOPAH MINING COMPANY (a Corporation),
Appellant,
vs.
WEST END CONSOLIDATED MINING COMPANY (a Corporation),
Respondent.

Certificate of Clerk to Exhibits.

I, H. R. Mighels, Clerk of the Supreme Court of the State of Nevada, do hereby certify that I have identified and transmitted to the Clerk of the Supreme Court of the United States at Washington, D. C., the following Exhibits in the above-entitled case, the same having been certified by the Clerk of the District Court of the Fifth Judicial District of the State of Nevada, in and for the County of Nye, after having been introduced in evidence in said case in the lower court, and having been transmitted by him to this Court on the appeal of said case:

1535 EXHIBITS.

Appellant's Exhibits.

1—Map.
2—Model.
3—Model.
4—Model.
5—Assay Estimate sheets.
6—Assay Certificate Sheets.
7—Patent.
8—Patent.
Wiley Cross "1"—Photograph.
Wiley Cross "2"—Photograph.

Wiley Cross "3"—Diagram.
Winchell Cross "1"—Diagram.
Winchell Cross "2"—Sample Rock.
Winchell Cross "3"—Sample Rock.
Winchell Cross "4"—Diagram.
Winchell Cross "5"—Diagram.—?
Winchell Cross "6"—Diagram.
Finch "1"—Diagram.
Finch "2"—Diagram.
Finch "3"—Diagram.
Finch "4"—Diagram.
Finch "5"—Diagram.
Finch "6"—Diagram.
Finch "7"—Diagram.
Finch "8"—Sample Rock.
Finch "9"—Sample Rock.
Finch Redirect "1"—Diagram.
1536 Siebert "1"—Diagram.
Siebert "2"—Diagram.
Siebert "3"—Sample Rock.
Siebert "4"—Sample Rock.
Searles "1"—Diagram.
Searles "2"—Photograph.
Searles "3"—Photograph.
Searles "4"—Diagram.
Searles "5"—Sample Rock.
Searles "6"—Sample Rock.
Searles "7"—Sample Rock.
Searles "8"—Diagram.
Searles "9"—Sample Rock.
Lawson "1"—Diagram.
Lawson "2"—Sample Rock.
Lawson "3"—Sample Rock.
Lawson "4"—Diagram.
Lawson "5"—Diagram.
Lawson "6"—Diagram.
Lawson "7"—Diagram.
Lawson "8"—Sample Rock.
Lawson "9"—Sample Rock.

Appellant also used and referred to, in oral argument, two plats from Monograph Twelve of United States Geologic Survey, showing (1) sections through Printer Boy Hill, and Little Ellen Hill, and (2) sections through Prospect Mountain and Fryer Hill, Leadville, Colorado.

1537 *Respondent's Exhibits.*

A—Model.
B—Map.
C—Map.
D—Map.
E—Map.
F—Map.
G—Map.

H—Map.
I—Patent.
K—Assay Report.
L—Assay Certificate.
M—Answer case West End Co. v. Jim Butler Co. No. 3061.
Wiley "1"—Sample Rock.
Wiley "2"—Sample Rock.
Wiley "3"—Sample Rock.
Wiley "4"—Sample Rock.
Wiley "5"—Diagram.
Wiley "6"—Diagram.
Wiley "7"—Diagram.
Wiley "8"—Sample Rock.
Wiley "9"—Sample Rock.
Chandler "1"—Sample Rock.
Chandler "2"—Diagram.
Hoxsie "1"—Sample Rock.
Winchell "1"—Sample Rock.
Winchell "2"—Sample Rock.
Winchell "3"—Sample Rock.
1538 Finch Cross "1"—Diagram.
Finch Cross "2"—Diagram.
Finch Cross "3"—Sample Rock.
Lawson Cross "1"—Sample Rock.
Lawson Cross "2"—Sample Rock.

In witness whereof, I have hereunto set my name and affixed the Seal of the Court, this 7th day of August, 1916.

[Seal Supreme Court, State of Nevada.]

H. R. MIGHELS,
Clerk of the Supreme Court of the State of Nevada.

1539 In the Supreme Court of the State of Nevada.

No. —.

JIM BUTLER TONOPAH MINING COMPANY (a Corporation), Appellant,
vs.
WEST END CONSOLIDATED MINING COMPANY (a Corporation), Respondent.

Return to Writ.

UNITED STATES OF AMERICA,
Supreme Court of Nevada, ss:

In obedience to the commands of the within Writ, I herewith transmit to the Supreme Court of the United States a duly certified transcript of the complete record and proceedings in the within entitled case, with all things concerning the same.

In witness whereof, I have hereunto subscribed my name and affixed the Seal of said Supreme Court, in Carson City, Nevada, this 7th day of August, 1916.

[Seal Supreme Court, State of Nevada.] H. R. MIGHELS,
Clerk of the Supreme Court of the State of Nevada.

1540 I hereby certify that all costs of the Jim Butler Tonopah Mining Company, appellant, and of the West End Consolidated Mining Company, respondent, herein, have been fully paid by the respective parties.

[Seal Supreme Court, State of Nevada.]

H. R. MIGHELS,
Clerk of the Supreme Court of Nevada.

1541 In the Supreme Court of the United States, October Term, 1916.

No. 628.

JIM BUTLER TONOPAH MINING COMPANY, Plaintiff in Error,
vs.
WEST END CONSOLIDATED MINING COMPANY, Defendant in Error.

Statement of Error Relied on by Plaintiff in Error and Notice of Parts of Record Necessary for Consideration of Such Points.

To Wm. Dickson, Esq., Messrs. Peck, Bunker & Cole, Downer, H. L. Atkinson, Attorneys for Defendant in Error:

In accordance with paragraph 9 Rule 10 of the Rules of the Supreme Court of the United States, as amended March 20, 1916—Notice is hereby given that upon the argument and hearing of said cause before said Court, Plaintiffs in Error will rely on the following Points:—

I.

The Supreme Court of the State of Nevada erred in holding and deciding that the crest or axis of the anticlinal vein in controversy in this action constituted in law such a top or apex of the vein within the meaning and intent of section 2322 of the Revised Statutes of the United States, as conferred upon the Respondent a right to follow said vein and extract and remove the ore therefrom underneath the surface and within the vertical boundaries of Appellant's patented mining claims, the Eureka and Curtis.

II.

The said Court having found and decided that the vein, the ownership of which is in controversy in this action, commonly
1542 called the West End McNamara Vein, was a single vein underlying the properties of both Appellant and Respondent, that such vein was in the form of an anticline or anticlinal fold, one of the limbs descending into the earth in a Northerly direction, the other in a Southerly direction, the defendant's discovery and discovery shaft in the West End claim being situated on the Northerly dipping limb of said anticlinal vein, the said Court erred in holding and deciding that the Defendant had a right to follow said vein on the downward course of the Southerly dipping limb into and underneath the surface of the Eureka and Curtis patented claims of Appellant.

III.

The said Court erred in holding and deciding that under section 2322 of the Revised Statutes of the United States the words "top or apex" of a vein, as contained in said section does not require that the vein should have a terminal edge within the boundaries of a claim, in order to entitle the owner of the claim to follow the vein on its downward course into lands adjoining, and said Court erred in holding and deciding that the crest or axis of an anticlinal vein constituted the top or apex of a vein within the meaning of said Section 2322 of the Revised Statutes of the United States.

IV.

The said Court having found and decided that the vein the ownership of which is in controversy in this action, commonly called the West End McNamara Vein, was a single vein underlying the properties of both Appellant and Respondent, that such vein was in the form of an anticline or anticlinal fold, one of the limbs of which descended into the earth in a northerly direction, and the other in a southerly direction, and that said vein had no terminal edge within the boundaries of Respondent's West End claim, the said Court erred in holding and deciding that the defendant had a right to follow said vein on its downward courses in opposite direc-
1542½ tions, to-wit, in a Northerly and Southerly direction from the crest or axis of the anticlinal vein.

V.

The Court erred in holding and deciding that the owner of a lode mining claim having therein the tops or apexes of two veins descending into the earth in opposite directions, may follow both veins on their opposite downward courses into and underneath the lands adjoining and the Court further erred in holding and deciding that the same rule should apply, and which the said Court by its holding and decision applied to the single anticlinal West End Vein, having its axis of crest within Respondent's West End claim.

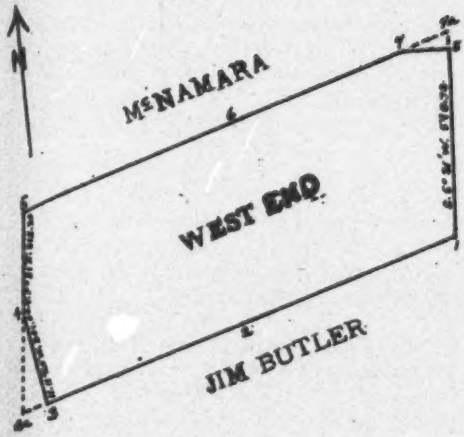
VI.

The said Court erred in holding and deciding that the Respondent was the owner and entitled to the possession of that part of the anticlinal vein commonly known as the West End McNamara Vein, which lies underneath the surface and within the vertical boundaries of Appellant's patented Eureka and Curtis claims.

VII.

The Court in its decision presented a diagram showing the exterior boundaries of the West End claim, which diagram is herewith reproduced.

(Here follows diagram marked p. 1543.)



No 628.

Jim Butler Mineral Mining Co. v. West End C. M. Co. } 1643.

1544 The Court held and decided that the line 1-8 on said diagram and the line 4-5 were the legal end lines of the claim, and that the line 4-3 was a side line. The court erred in holding and deciding that said lines 1-8 and 4-5 were the legal end lines of said claim and also erred in holding and deciding that said line 4-3 was a side line.

VIII.

The Court erred in holding and deciding that under Section 2322 of the Revised Statutes of the United States, end lines need not be parallel throughout, and that if one end line is straight and the other broken, one being parallel to the other for a part of the distance only and then changing its direction, that the true end lines of the claim are the parallel parts of said end boundaries, and the other lines are said lines, and the Court erred in holding and deciding that the Respondent was entitled to follow the vein in controversy on its downward course into and underneath the surface of Appellant's patented Eureka and Curtis claims, between planes drawn through the lines marked 1-8 and 4-5 on the diagram set forth under assignment VII and such planes extended indefinitely in their own direction southerly.

IX.

The said Court erred in holding and deciding that Appellant was not the owner of that portion of the vein in controversy which lies underneath the surface and between the vertical boundaries of the Eureka and Curtis patented claims of Appellant.

Plaintiff in error indicates the following as the parts of said record which are necessary for the consideration of such points:—

All of Volumes I and II of the record, transmitted by the clerk of the Supreme Court of the State of Nevada to the Clerk of the Supreme Court of the United States, and containing a transcript
1545 of the proceedings had, and testimony taken at the trial of the case before the trial court.

Also the following documents and papers appearing in volume III of said record:

1.—Amended Complaint (Document No. 1209).
2.—Answer (Document No. 1191).
3.—Replication (Document No. 1201).
4.—Opinion of Trial Court (Document No. 1137).
5.—Findings of Fact and Conclusions of Law (Certified Copy). Document No. 1164.
6.—Judgment (Document No. 1235).
7.—Judgment Roll (Document No. 1184).
8.—Notice of Appeal from Judgment, etc. No. 1475.

All other documents contained in said volume III, are to be excluded from the printed record.

In addition to the foregoing, there are to be included in the

printed record, all documents filed and proceedings had before the Supreme Court of the State of Nevada from the date of its decision of the above entitled cause and which are contained in the record forwarded by the Clerk of the Supreme Court of the State of Nevada to the Clerk of the Supreme Court of the United States and including the opinion of the Supreme Court of the State of Nevada.

Also all exhibits and illustrative maps, mentioned and referred to in the above enumerated parts of the Record.

CURTIS H. LINDLEY,
HUGH H. BROWN,
Attorneys for Plaintiff in Error.

Dated, August 30th, 1916.

Due service of the within and receipt of copy acknowledged this 31st day of August 1916.

PECK, BUNKER & COLE,
DICKSON, ELLIS, ELLIS & SCHOULDER,
CHENEY, DOWNER, PRICE AND HAWKINS,
H. H. ATKINSON,
Attorneys for Defendant in Error.

1546 [Endorsed:] 628—25458. No. 628 October Term. In the Supreme Court of the United States. Jim Butler Tonopah Mining Company, Plaintiff in error vs. West End Consolidated Mining Company, Defendant in Error. Statement of Errors and Notice Curtis H. Lindley and Hugh H. Brown, Attorneys for Plaintiff in Error.

1547 [Endorsed:] File No. 25458. Supreme Court U. S., October term, 1916. Term No. 628. Jim Butler Tonopah Mining Co., Pl'ff in Error, vs. West End Consolidated Mining Company. Statement of errors to be relied upon and designation by plaintiff in error of parts of record to be printed, and proof of service of same. Filed September 5, 1916.

Endorsed on cover: File No. 25458. Nevada Supreme Court. Term No. 628. Jim Butler Tonopah Mining Company, plaintiff-in-error, vs. West End Consolidated Mining Company. Filed August 21st, 1916. File No. 25458.

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In the Supreme Court

OF THE

UNITED STATES

OCTOBER TERM, 1917

JIM BUTLER TONOPAH MINING COMPANY,
Plaintiff in Error,
vs.
WEST END CONSOLIDATED MINING COMPANY,
Defendant in Error.
} No. 249

BRIEF OF PLAINTIFF IN ERROR.

The cause comes to this court on Writ of Error to the Supreme Court of Nevada from a judgment rendered in favor of Defendant in Error, affirming a similar judgment of the trial court. The parties are here aligned as in the trial and State Supreme Court. For convenience the Plaintiff in Error will be hereinafter referred to as the Jim Butler Company, and the Defendant in Error as the West End Company.

STATEMENT OF THE CASE.

The Jim Butler and West End Companies are mining proprietors owning mining claims contiguous to each other in the Tonopah Mining District, Nye County, Nevada.

The West End Company, in the conduct of its mining operations originating in the West End claim, passed outside of and beyond the vertical plane of the side line common to both companies, entered underneath the surface of the Eureka and other claims belonging to the Jim Butler, and extracted and removed large quantities of ore. Suit was brought by the Jim Butler to recover the value of this ore, for an accounting, and for an injunction inhibiting further trespasses.

Amended Complaint, Transcript Vol. 2, p. 668.

The West End Company admitted the entry and extraction of the ore, pleaded justification, setting up its right to extract the ore from underneath the surface of the Eureka and other claims of the Jim Butler Company, and alleged that in extending its workings underneath the surface of the Jim Butler properties it was following a vein which had its top or apex within the West End claim, in the exercise of the extralateral right conferred by Section 2322 of

MAP

TOO

LARGE

FOR

FILMING

the United States Revised Statutes, and that the ore extracted was a part of the West End vein.

Answer, Transcript Vol. 2, p. 657.

To this answer the Jim Butler Company filed its replication, traversing the facts alleged as matters of defense.

Replication, Transcript Vol. 2, p. 664.

Before proceeding with a statement of the findings and decision of the trial court, the judgment of affirmance by the Supreme Court of Nevada, and the errors assigned, it will expedite the consideration of the cause if we enter into a more detailed presentation of the facts.

At the oral argument maps, models and illustrations will be utilized, and the court will have become informed as to the salient features of the case, the questions of law involved, and the contention of the respective parties. But for convenience of examination and study, we herewith reproduce some of the important maps, exhibits and illustrations.

Inserted herein as Figure 1 is a reproduction on reduced scale of the Jim Butler general plan map Exhibit 1. This map shows the exterior boundaries of mining claims owned by the respective parties, the West End owned by the West End Company, and the Eureka and Curtis owned by the Jim Butler Company. All the properties are patented, and no

dispute arises as to the title. The inquiry is simply as to what was granted to the respective parties by their patents. The map shows the underground workings underneath the surface of both companies, the irregular shaped areas colored representing stopes from which ore has been extracted. The other colored features represent drifts, shafts, winzes, and other mine openings.

The McNamara, joining the West End on the North, belongs to neither party, but as its workings are on the same vein, it became important to be considered in the investigation of vein structure.

All of the underground workings shown on the map as being underneath the surface of the West End are West End workings. A greater part of those underneath the surface of the Eureka are also those of the West End Company, and fix the lines and extent of the trespass complained of in this action.

It will be observed that the end lines of the West End, i. e., the East and West boundaries, are not parallel throughout, the West line being a broken one. The contention made as to the effect of this upon the asserted extralateral right of the West End will be reserved for later statement and consideration.

It is conceded that *prima facie* the Jim Butler is the owner of all the vein lying underneath the surface, and that it devolved upon the West End to show by a preponderance of evidence, as justification for its invasion of Jim Butler territory, that it had

within its West End claim the apex of the vein so situated with respect to its surface boundaries as to confer an extralateral right, which, by the extension of its bounding planes, would embrace the segment of the vein in dispute.

As to vein structure, the Jim Butler contended at the trial that there was no apex of the vein within the territory of either party; that the vein was in form a rolling anticlinal vein or fold with [redacted] dipping limbs, exhibiting in cross section roughly the appearance of a convex segment of a circle, the crest or axis of the fold or anticline traversing the West End claim diagonally in a Northwesterly and Southeasterly direction.

The West End contended that there were in fact two veins formed at two different periods, the later one dipping to the North and the older dipping to the South, and that the so-called crest or axis of the anticline was in fact a line of junction on the strike formed by the intersection of the later with the older vein.

Practically the entire testimony of both sides of the case was directed to the issue thus raised.

The facts as found and adopted by the Supreme Court of Nevada sustained the contention of the Jim Butler Company that the vein was a single vein, anticlinal in form, but both lower courts ruled that the crest or axis of the anticline constituted in law a top or apex, which gave to the West End an extralateral

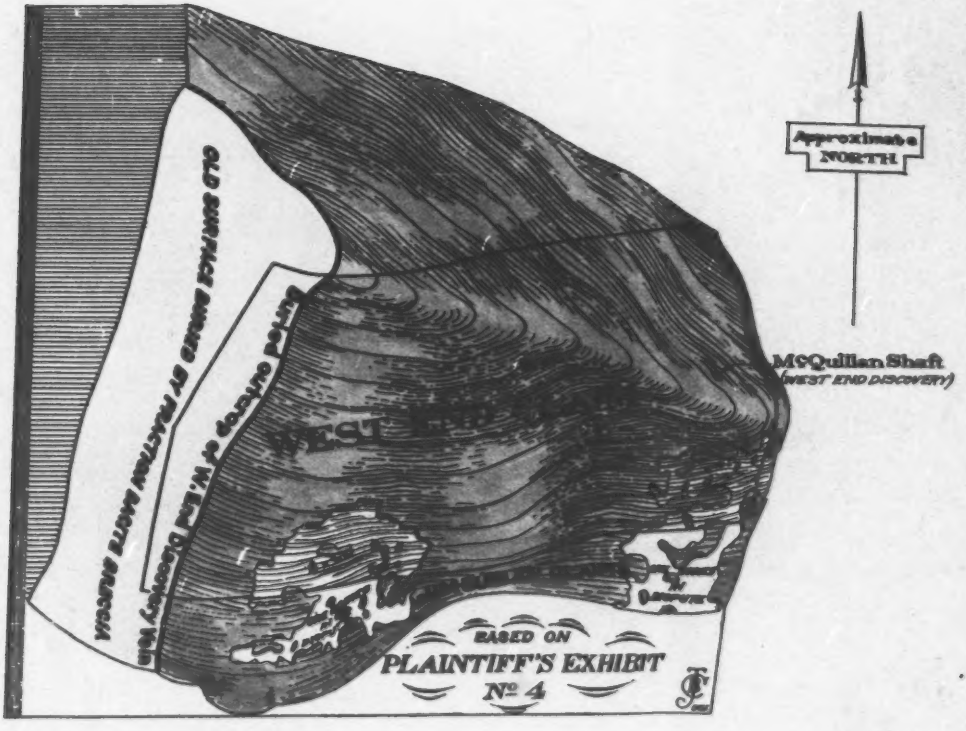
right on both the North and South dipping limbs of the anticline, and that it might exercise this right in two opposite directions.

Plaintiff's Block Model Exhibit No. 4 is herewith reproduced in the form of a stereogram as Figure 2. (Note—The red coloring represents vein and the uncolored portions excavated ore bodies.)

There is no exposure of the vein at or near the surface. It is covered with later flows of volcanic rock known as "Midway Andesite" and "Fraction Dacite Breccia." It can only be reached by sinking through this overburden or "cap" by means of shafts.

The Block Model and the stereogram, Figure 2, show the form of the vein, its situs in the ground, and the axis or crest of the anticline after the capping has been removed. As will appear from an inspection of the various exhibits and especially the skeleton models introduced by each party the vein in question is what is known as a blanket vein and was named and referred to in the early history of Tonopah as the "big flat vein." The two slopes or limbs of this anticlinal vein dip very flatly on their downward course both to the North and to the South, especially in the Eastern portion of the West End claim, where the dip is only 17° measured from the horizontal. Transcript Vol. II, pp. 650-651.

The discovery on the West End claim was by means of the McQuillan shaft, at a point so indicated on the surface map, Figure 1, heretofore inserted herein,


Approximate NORTH
McQuillan Shaft
(WEST END DISCOVERY)
BASED ON
PLAINTIFF'S EXHIBIT
No. 4

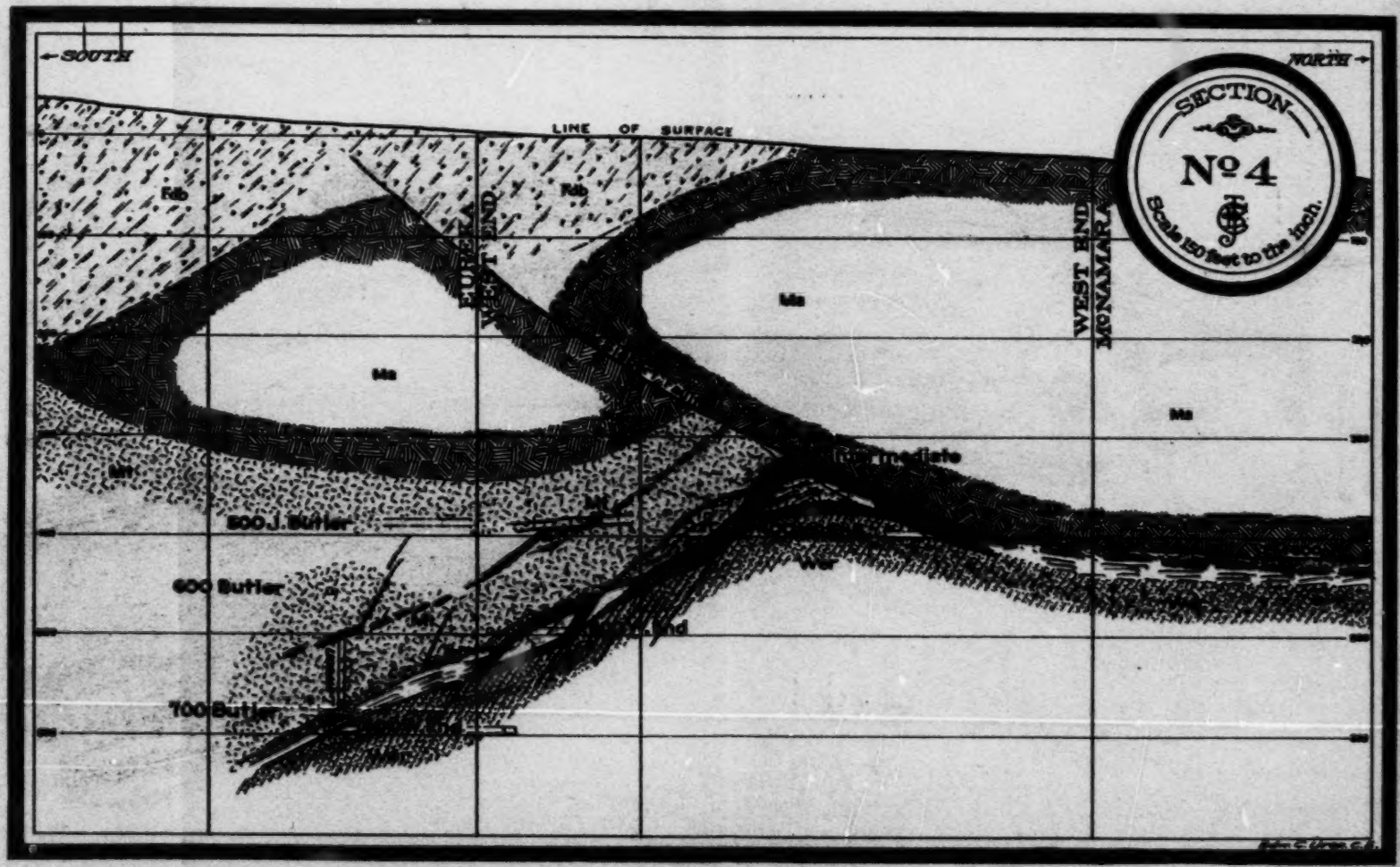

SOUTH
NORTH
SECTION
Nº 4
Scale 150 feet to the inch.
LINE OF SURFACE
EUREKA
WEST END
WEST END
McNAMARA
Rib
Rib
Ma
Ma
Ma
Intermediate
500 J. Butler
600 Butler
700 Butler

FIGURE 5

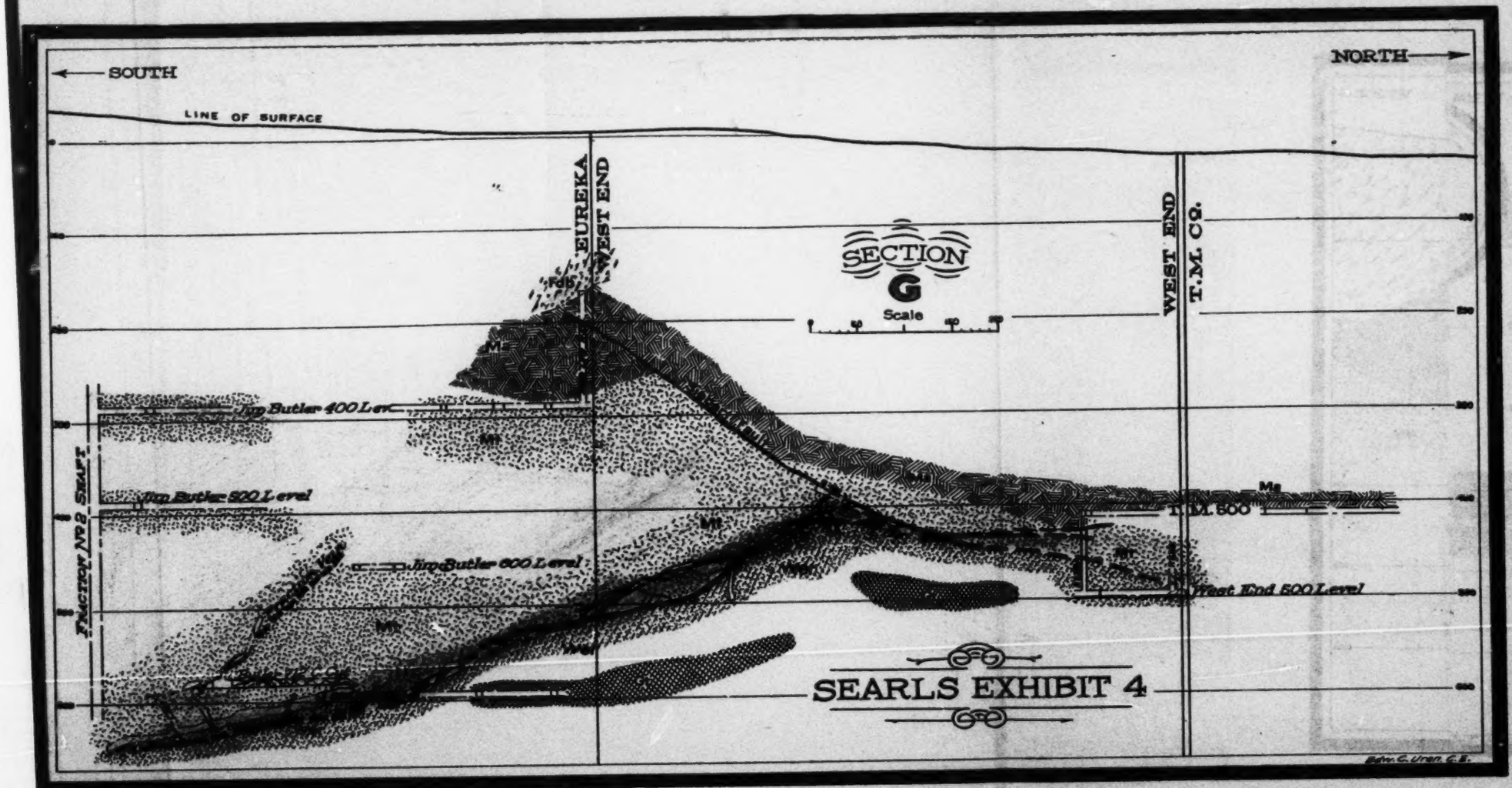

SOUTH
NORTH
LINE OF SURFACE
EUREKA
WEST END
WEST END
T.M. CO.
SECTION
G
Scale
Fds
Mr
Ms
Jim Butler 400 Level
Jim Butler 500 Level
Jim Butler 600 Level
T.M. 500
West End 500 Level
Fraction No 2 Shaft
SEARLS EXHIBIT 4

FIGURE 4

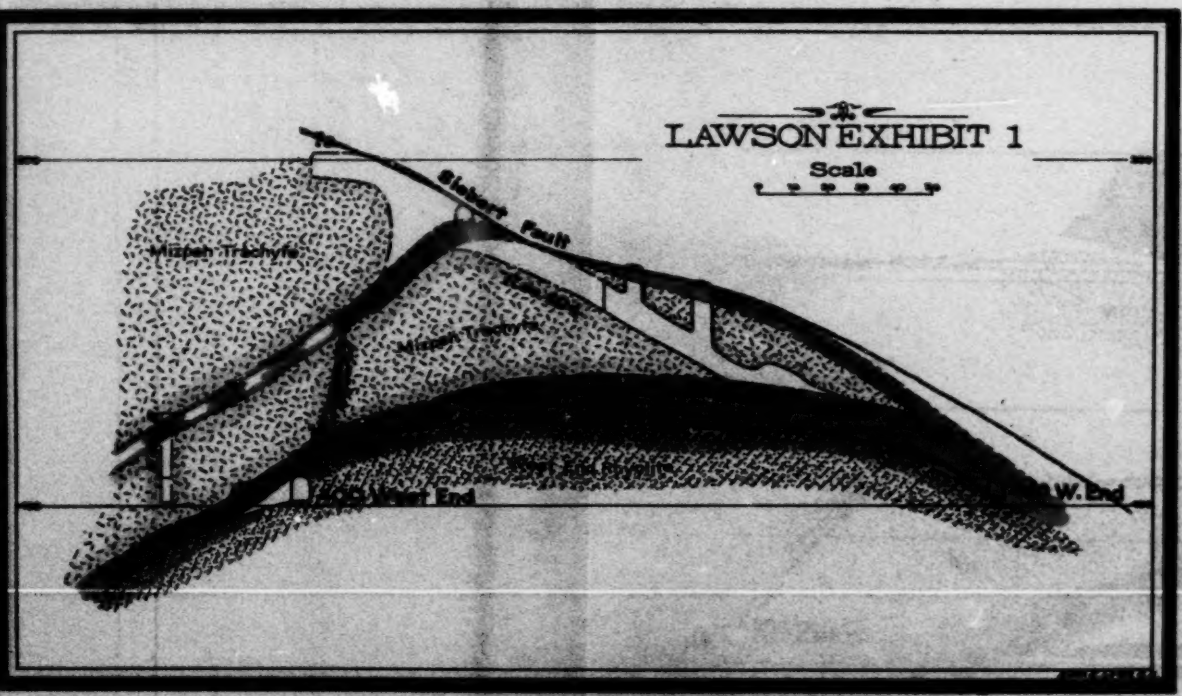


FIGURE 3

and on the Stereogram, Figure 2. This shaft at considerable depth encountered the north dipping limb of the vein. The spaces marked "ore bodies in dispute" on Figure 2 represent the trespass complained of underneath the surface of the Jim Butler claims, and are on the opposite or South dipping limb of the anticline.

An inspection of the Glass Model introduced by the Jim Butler Company, identified as Plaintiff's Exhibit 3, will also exhibit the form of the vein. We also herewith reproduce on reduced scale three cross sections admitted in evidence and identified as Section No. 4, Lawson's Exhibit 1, and Section G, Searls' Exhibit 4, marked respectively Figures 3, 4, 5, which exhibit the vein structure in these sections.

Opposite page 690, Vol. II of the Transcript, is a cross section said by the Supreme Court of Nevada "to represent a cross section of the vein where the "two limbs have been shown by development work "to be united at the crest of the anticlinal fold."

This cross section was taken at a point where the vein had been scored by the "Siebert Fault," a later feature. The Lawson Exhibit No. 1, heretofore reproduced as Figure 4, is a more detailed showing of the conditions existing at this point. This condition has no longitudinal extensions in either direction, and there is nothing to be inferred from the appearance of the illustration used by the court to detract

from its finding that the vein is a single vein and exists in the ground in the form of an anticline.

While thus determining the form of the vein, as heretofore noted, the courts below both held that the axis or crest of an anticlinal vein constituted in law the top or apex of the vein, and that the West End invasion of Jim Butler Territory was lawful. It was also determined that the broken character of the West end line boundary of the West End claim did not impair the West End extralateral right.

The Supreme Court of Nevada in its decision of the case thus stated the questions involved on the appeal:

> "The case presents two main questions of law, to wit:
>
> *"First:* Whether the fact that the Westerly end line of the surface area of the West End claim as patented, being not straight, but a broken line, in and of itself deprives the owner of that claim of extralateral rights upon any vein apexing therein.
>
> *"Second:* Whether, within the meaning of the Act of Congress, the crest or crown of a vein which is found in the form of a single anticline may be regarded as the top or apex of the vein and extralateral rights exist upon such vein in opposite directions."
>
> Opinion, Trans. Vol. II, p. 691.

ASSIGNMENTS OF ERROR.

The Assignments of Error are IX in number. Assignments I, II, III and IV assign as error the holding and decision of the court below, that the crest or axis of an anticlinal vein constituted in law such a top or apex of the vein within the meaning and intent of Section 2322 of the Revised Statutes of the United States as conferred upon the West End Company the right to follow the vein into Jim Butler territory. These assignments differ only as to the form in which the error is pointed out.

Assignment V attacks a ruling of the court made in the course of its opinion that if a mining claimant had the tops or apices of two veins within his claim, dipping in opposite directions, he would have an extralateral right on both veins.

This question was injected into the case by the court by way of illustration in support of its opinion on the main question and also by reason of the fact that there was before the court the contention urged by the West End that there were two veins instead of a single vein. We comment on this more fully later on. Believing the position taken by the court to be unsound in law, although the ruling may not strictly be subject to assignment as error, we specified it as error. It will and appropriately may be discussed in the course of the argument.

Assignments VII and VIII attack the decision of

the court on the effect of the non-parallelism of the West End end lines.

Assignments VI and IX are general and precautionary in their nature. If our contention as to the other assignments, or either of them, is sustained by the court, the judgment of the courts below will necessarily be reversed without resorting to a discussion of the general assignments VI and IX.

We will discuss the questions raised by these assignments in the order named.

ARGUMENT.

We take up for discussion the assignment of errors in the order in which they are above stated, and divide our discussion into three branches.

I. The error committed by the court in determining that the axis or crest of the anticlinal vein constituted in law such a top or apex as will confer upon the owner of a lode mining claim an extralateral right.

II. The error committed by the court in determining that when a mining claim contained the tops or apices of two veins dipping in opposite directions, the owner could pursue both veins in their opposite downward courses into lands adjoining.

III. The error committed by the court in determining that the West End Company could

exercise an extralateral right notwithstanding the non-parallelism of the end lines of its claim.

These are the only questions which require consideration by this court.

I.

THE CREST OR AXIS OF AN ANTICLINAL VEIN IS NOT THE TOP OR APEX WITHIN THE MEANING OF SECTION 2322 OF THE REVISED STATUTES. EXTRALATERAL RIGHTS MAY ONLY BE EXERCISED BY THE PROPRIETOR OF VEIN WHICH HAS THE ESSENTIAL ELEMENTS OF A TERMINAL EDGE WITHIN THE CLAIM AND A DOWNWARD COURSE THEREFROM.

As pointed out in the opinion of the Supreme Court of Nevada, the answer to the question

> "whether within the meaning of the Act of Congress the crest or crown of a vein which is found in the form of a single anticline may be regarded as the top or apex of the vein, and extralateral rights exist upon such vein in opposite directions

must be found in an interpretation of that portion of the Mining Act which contains the grant of extralateral rights, which reads as follows:

> " 'The locator of all mining locations shall have the exclusive right of possession and enjoyment of all the surface included within the lines of their locations, and of all veins, lodes, and ledges throughout their entire depth, the top or apex of

which lies inside of such surface lines extended downward vertically, although such veins, lodes, or ledges may so far depart from a perpendicular in their course downward as to extend outside the vertical side lines of such surface locations. But their right of possession to such outside parts of such veins or ledges shall be confined to such portions thereof as lie between vertical planes drawn downward as above described, through the end lines of their locations, so continued in their own direction that such planes will intersect such veins or ledges. And nothing in this section shall authorize the locator or possessor of a vein or lode which extends in its downward course beyond the vertical lines of his claim to enter upon the surface of a claim owned or possessed by another.' "

Section 2322, *U. S. Rev. Stats.*
Transcript Vol. II, p. 691.

The definition of the term "apex" as employed in the mining statute involves the elements of terminal edge of a vein and downward course extending therefrom.

This was the conception of the pioneer miners who originated the rules and regulations governing their mining rights, and which later were crystallized and codified in the Mining Acts of 1866 and 1872. They conceived of a vein as a sheet of mineralized material dipping into the ground at an inclination from the horizontal. The edge of this mineralized sheet as it came to the surface and terminated in an outcrop or the termination of this edge up against overburden or other material mantling or capping the surface,

constituted the apex of the vein. It was, in other words, the upper terminal edge of the vein which they located and measured off into the varying lengths prescribed by their local customs.

This conception has persisted throughout the Congressional legislation on this subject which followed, as is evident from the expressions of all the authorities which have attempted to interpret this legislation.

> "Now, it is a part of the statute law of the United States that these locations shall be upon the top and apex of the vein. The law goes upon the hypothesis that all veins are more or less vertical in the earth. They come up something in this manner: if we suppose this sheet of paper represents the vein, that they extend in some position vertically, or somewhat so, to the surface of the earth, and that the end or top of the vein comes up towards or near the surface, and the miner in searching for it will make his location in reference to the end or top which comes up toward the surface." Judge Hallett in *Iron Silver Mining Co.* v. *Murphy,* 3 Fed., 368, 371.

This is also the view expressed by this court in the latest decision involving extralateral rights which it has handed down:

> "An apex is, on cited authority, defined to be 'all that portion of a terminal edge of a vein from which the vein has extension downward in the direction of the dip.' And it is further said that the definition has been approved in Lindley on Mines, because as therein expressed it 'involves

the elements of terminal edge, and downward course therefrom.' We may accept the definition. In its application, however, it immediately encounters a question of fact—the locality of the terminal edge; and in this case the State courts did not find it to be where plaintiff asserted it to be.

"But counsel make much of—indeed, appear to give absolute effect to—the other elements of the definition, that is, 'extension downward' or 'downward course' from the terminal edge. But this element again has no significance whatever independently of the 'terminal edge' of the vein found, as we have said, not to be where plaintiff contended it to be. Plaintiff's contention is that the terminal edge extends 200 feet along the Osborne fault and from thence there is a pronounced downward course to the southerly boundary of the Stewart Fraction claim, and that therefore *the two elements essential to an apex* in the accepted definition exist, namely, *'terminal edge and downward course'* within 'vertical planes parallel with the vertical planes of the end lines of the claim extended downward.'" [Note: Italics in this brief are ours.]

Stewart Mining Company v. *Ontario Mining Company*, 237 U. S., 350, 360.

See, also,

Alameda Mining Company v. *Success Mining Company* (Idaho), 161 Pac., 862, 865,

which quotes with approval the foregoing definition adopted by this court.

According to the definition just given, the horizontal sheet "a" on figure 6 here inserted, has no apex, for one of the prime elements, "downward course," is lacking. Neither has the anticlinal fold

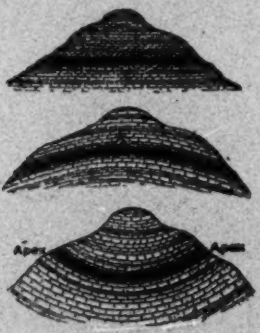


FIGURE 6

"b" any apex, for there is lacking the essential element of "terminal edge" from which the vein can be followed on a "downward course." From either of the terminal edges indicated on the diagram it is only possible to follow upward on the vein. The synclinal fold "c" has two apices, for the vein can be followed on its downward course from either terminal edge there illustrated to an equitable center beyond which there is no further extension downward.

For the purposes of further illustration, we present in figure 7 a cross section which represents an idealized situation found in the famous Leadville District of Colorado. The stratum d d represents the underlying white porphyry; b b, the vein material; c c, the

underlying blue limestone. The line A x and B B represent the crests of the ridges formed by the anticlinal folds.

If the overlying porphyry on the crests of the anticlinal folds were removed, leaving the vein material

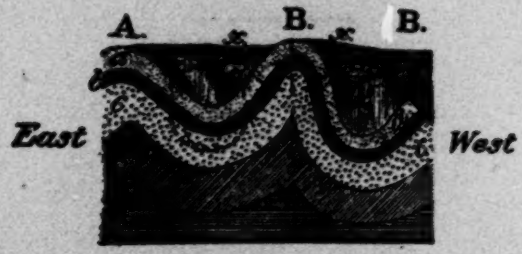
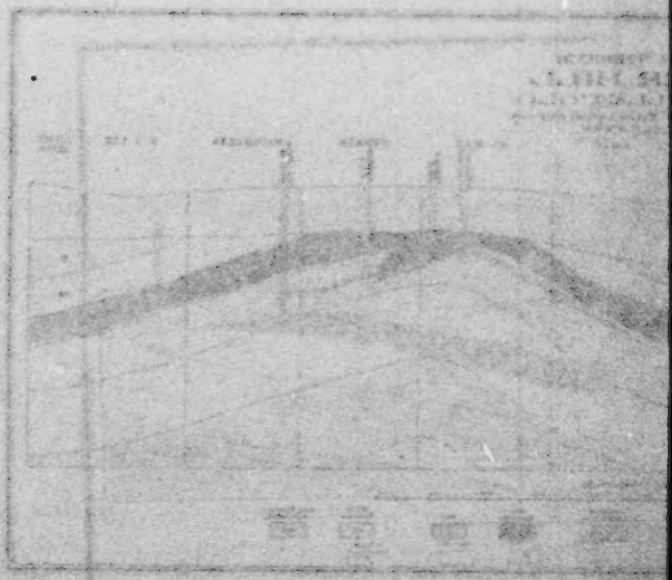
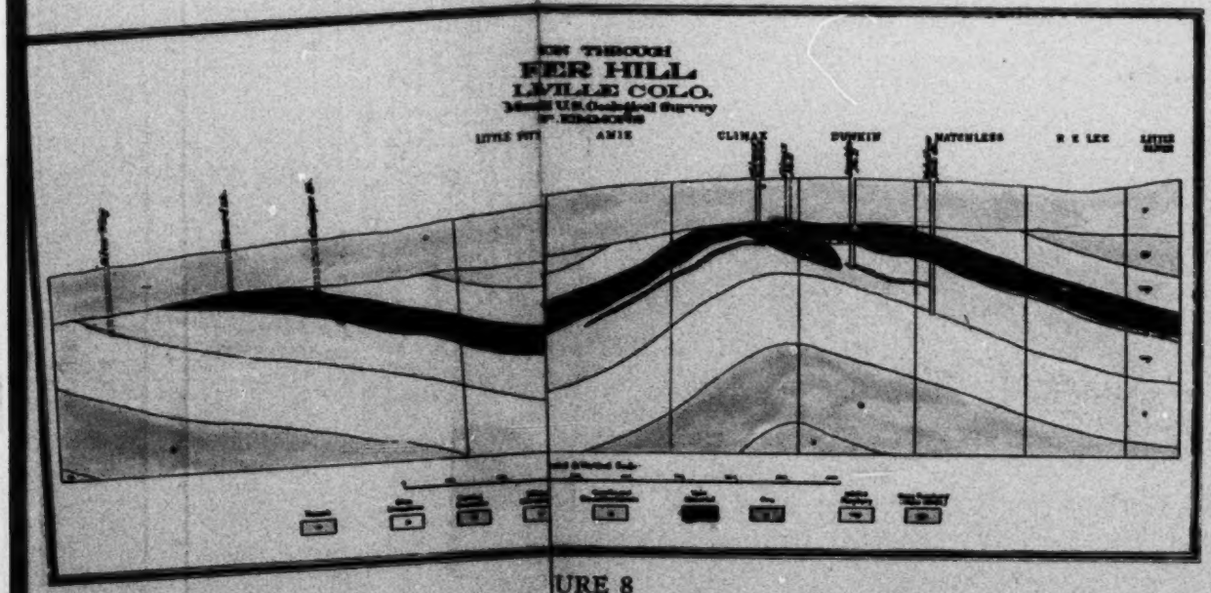


FIGURE 7

there exposed, and assuming that in this uncovered position the deposit would still fall within the definition of a vein or lode, neither A x nor B B would be apices. They are tops, or crests, of the folds, but not apices of the deposit. The exposed surface would be part of the top of the deposit, contradistinguished from the bottom lying on the limestone.

With the vein in position, as shown on this figure, it might be said that its highest part, or the part approaching nearest to the surface (assuming that there was no surface exposure elsewhere), would be along the crest of the fold. But this would not be the top or apex of the vein. It would be the top, or apex, of a fold in the vein. If this line were the apex of the vein, a location with side lines along the crest would





URE 8

give the locator the right to follow the vein in both directions, east and west, "up hill and down dale," indefinitely, so far as the vein preserved its continuity and identity.

The only exposures of the vein in position as shown on the figure that can possibly answer to the definitions given by the courts are those indicated by the abrupt terminations at the east and west.

While the conditions in Leadville are not in all respects similar to those at Tonopah, since the Leadville veins in many instances dipped at a flatter angle, the principle involved is in no wise altered and if the mineral deposits in Leadville had no apices because they had no terminal edges along the crests of these anticlinal rolls then it is equally true that for the same fundamental reason they do not constitute apices when such anticlinal rolls are found to occur in Tonopah. Fortuitous geographic position does not alter the law applicable to such deposits, nor does the change of a few degrees in dip affect the result when the underlying principle remains the same.

The following reproduction, inserted here as Figure 8, of a cross section appearing in Emmons' remarkable monograph on the Leadville District (Monograph XII, U. S. Geological Survey), is peculiarly apposite.

By comparison with Figures 3, 4 and 5, inserted hereinbefore, which represent in cross section the actual slope or inclination of the two opposite dipping

limbs or segments of the anticlinal vein in the eastern position of the West End claim, it will be seen that the angle of inclination of the opposite slopes of the anticline appearing in the Leadville situation, and also in the Tonopah situation, are practically identical. Bearing in mind what the courts have said concerning the denial of an extralateral right in Leadville, wherever there is an absence of a terminal edge or interruption in a vein, and only an upward swell or roll, so that "in its ascent towards the surface . . . it turns over and pursues its course downwards as a part of the same vein," it is difficult to perceive why the same principle should not apply to a vein in Tonopah possessing substantially similar physical attributes.

The element of terminal edge is an essential part of the legal definition of the term "apex," in the opinion of practically all of the text writers on the subject.

> "Conceiving a vein or lode to be an intrusive sheet of mineralized matter of varying thickness found in the mass of the mountain, the apex of a vein is thus seen to be that edge of the sheet which shows on the surface of the location, or is nearest to the surface. It is not a point, though apex naturally suggests point. It is not a line, though it has the full extension of the upper edge of the lode. It is the whole surface of the upper edge of the vein, with all the width and length which that edge has."
>
> *Costigan on Mining Law*, 139-140.

"The mere fact of proximity to the surface is

insufficient to establish the apex without the evidence that it is the upper edge or end of the vein."

Barringer and Adams, The Law of Mines and Mining, p. 442.

"In the mathematical sense, an apex means the highest point; but it is not used in this sense in the statute. As used therein it means the edge or termination of the vein which comes to the surface of the earth, forming an outcrop, or which comes nearest to the surface of the earth when the vein terminates before it reaches the surface. . . . It may not be the highest point of a vein, as such highest point may be found in a swell of the vein."

Shamel—Mining, Mineral & Geological Law, 193, 197.

"The top or apex of a vein or lode is the highest point thereof and may be at the surface of the ground or at any point below the surface; the end or edge of a vein nearest the surface."

Mines & Minerals, 27 Cyc., 537.

"The end or edge of a vein nearest the surface."

Raymond—Glossary of Mining and Metallurgical Terms. Trans. Am. Inst. M. E., Vol. IX, p. 102.

Counsel for the West End Company in the court below quoted from the Century Dictionary defining an apex to be the "top of an anticlinal fold," but this definition is coupled with the statement that the term

is there employed in a geological sense and does not purport to be a definition of its legal significance. The mining acts "were not drawn by geologists or for geologists."

Eureka Cons. M. Co. v. *Richmond M. Co.*, 4 Saw., 302, 311, Fed. Cas. No. 4548.

The courts have had occasion to discuss with elaborate detail the various elements that enter into the legal definition of the term "apex." Probably the most interesting and instructive of all the adjudicated cases is the pioneer case of *Duggan* v. *Davey*, 4 Dak., 110, 26 N. W., 887. The decision of the Supreme Court of Dakota follows, in the main, the opinion given by the trial court. It is a lucid and masterly presentation of the law, and several expressions of the court are well worth quoting in support of our contention that a terminal end or edge of a vein is an essential element of apex definition.

> "The definition of the top or apex of a vein usually given is 'the end or edge of a vein nearest the surface' (p. 900); . . . Justice Goddard, a jurist of experience in mining law, in his charge to the jury in the case of *Iron Silver* v. *Louisville*, defines 'top' or 'apex' as the highest or terminal point of a vein 'where it approaches nearest the surface of the earth and where it is broken on its edge, so as to appear to be the beginning or end of the vein.' . . . The word 'apex' ordinarily designates a point, and so considered the apex of a vein is the summit; the highest point in the vein in the ascent along the line of its dip

or downward course, and beyond which the vein extends no further, so that it is the end, or reversely, the beginning, of the vein. The word 'top,' which includes 'apex,' may also include a succession of points,—that is, a line,—so that by the 'top' of a vein would be meant the line connecting a succession of such highest points or apices, thus forming an edge" (p. 901).

The case of *Illinois Silver M. Co.* v. *Raff* (New Mexico), 34 Pac. Rep., 544, is a case possessing many points of similarity to the case at bar since the plaintiffs in error (defendants below) had invaded adjoining territory and attempted to justify by asserting the existence of the apex of the vein in their own territory which they had followed down beyond their side lines. The following excerpts from the decision will explain the physical facts and the court's holding:

"The plaintiffs in error are the owners of a patented claim, the Illinois, situated in the Kingston district, in Sierra County. The defendants own the Calamity claim, lying east of, and adjoining, the Illinois. Plaintiffs, working their ground, passed out under the east side lines of the Illinois, and into the ground of the Calamity, extracting ore in large quantities therefrom. Defendants brought suit in ejectment. . . . The defendants contend that, . . . the so-called apex is a point upon the lime mineral lode or zone whence the shale has been eroded upon the throwing up, in a rolling form of said lime zone . . . The zone or mass may follow the undulations of a broken country down into the valley, and rising over the divides, cutting through, covered by, or overlapping other formations; but until

it is broken, and the edge exposed, or some edge or end as a beginning point found, from which it can be followed down at some angle below the horizontal, there is no apex from which it can be followed beyond the side lines of a claim located upon it" (p. 546).

The peculiarities of the Leadville ore deposits gave rise to an epidemic of mining litigation. In many of these cases the question became vital as to whether an anticlinal roll or undulation in the vein constituted an apex and received critical consideration. In one of these cases, Justice Miller, at that time a member of this court and one of its ablest mining jurists, in the performance of his duties on the circuit, charged a jury, as follows:

"The next point is, that it is denied that there is a top or apex to this ledge or vein, and that if there is such a one it is not within the side lines of the plaintiff's patent. Perhaps upon that point the defendants have mainly rested their case. I think that you will agree with me, as all the counsel agree and all the witnesses agree substantially, conceding that there is a vein, that the top or apex of a vein, within the meaning of the act of Congress, is the highest point of that vein where it approaches nearest to the surface of the earth, *and where it is broken on its edge so as to appear to be the beginning or end of the vein.* [Note: Italics in this brief are ours.] The word 'outcrop' has been used in connection with it, and in the true definition of the word 'outcrop' as it concerns a vein, is probably an essential part of the definition of its apex or top; but that does not mean the strict use of the word 'outcrop.' That

would not, perhaps, imply the presentation of the mineral to the naked eye, on the surface of the earth, but it means that it comes so near to the surface of the earth that it is found easily by digging for it, or it is the point at which the vein is nearest to the surface of the earth; it means the nearest point at which it is found toward the surface of the earth. And where it ceases to continue in the direction of the surface, is the top or apex of that vein. It is said in this case that the point claimed to be the top or apex is not such, because at the points where the plaintiff shows or attempts to prove an interruption of that vein, in its ascent towards the surface, and what he calls the beginning of it, the defendants say that is only a wave or roll of the general shoot of the metal, and that from that point it turns over and pursues its course downwards as a part of the same vein, in a westerly or southwesterly direction. It is proper I should say to you, if the defendants' hypothesis be true, *if that point which the plaintiff calls the 'highest point,' the 'apex,' is merely a swell in the mineral matter, and that it turns over and goes on down in a declination to the west, that it is not a true apex within the statute.* It does not mean merely the highest point in a continuous succession of rolls or waves in the elevation and depression of the mineral nearly horizontal."

Stevens v. *Williams,* Fed. Cas. No. 13,413, p. 40, 43.

The case reported immediately following this case (No. 13,414) and having the same title indicates that these ore bodies dipped at an angle of 13° to 15° from the plane of the horizon.

Another learned mining jurist, Judge Hallett, in

a charge to a jury in a case in the Federal District Court used the following language:

> "And first we may say, by way of definition, that the top or apex is the *end or edge or terminal point* of the lode nearest the surface of the earth. It is not required that it shall be on or near or within any given distance of the surface. If found at any depth, and the locator can define on the surface the area which will enclose it, the lode may be held by such location. Now, whether there is such an *end, edge or terminal point* of the vein or lode at any depth in plaintiff's ground, is the question to be determined by the evidence.
>
> . . . . . .
>
> "We come next to the position assumed by the defendants, to the effect that the lode is continuous from side to side of plaintiffs' location, and that *the part which plaintiffs claim to be a top or apex is only an upward swell, ridge, or high point in the vein from which it descends in both directions.*
>
> . . . . . .
>
> "And if it is continuous, as suggested—that is to say, *if coming in at one side it passes unbroken to the other—the plaintiff cannot follow it beyond the lines of its location.* . . . And no location can be made on the middle part of a lode, or otherwise than at the top or apex, which will enable the locator to go beyond his line."
>
> *Iron Silver Mining Co.* v. *Murphy*, 3 Fed., 368, 375-76.

The vein here involved is of the same character as the veins in these cases just quoted from. What defendant in error claims as an apex of the vein in the West End claim is merely an "upward swell or ridge . . . from which it descends in both di-

rections" and for portions of its extent at least as found by the trial court is "continuous . . . coming in at one side it passes out unbroken to the other." It comes in from the North, "turns over and goes down in a declination to the" South. What matters it if in some of the cases cited there were other undulations or rolls? That does not alter any principle involved. Where shall the line be drawn as to the size or number of the undulations necessary to overcome the principle? The courts in each case have laid down the principle—not that summits of rolls shall not be considered apices merely because they are rolls—*but because they are continuous vein matter —unbroken—without terminal edges.* Each case is to be determined by the facts of the case as applied to the claim involved and if a vein comes up into a claim and rolls over and goes down on an opposite downward course through the other side of the claim, as was the case in the authorities cited, it matters not that there may be other rolls or ridges far removed from the claim. The rolls involved in those cases were not local and insignificant. The fact that they follow the undulations of "hills and valleys" is sufficient to establish the contrary. The courts are not going to perform the impossible and look into the undeveloped ground to prophesy whether there are other undulations or not on beyond. There may be in the case of the vein in question,—and if such other undulations be found, shall this destroy the extralateral right claimed by defendant in error—and does

the mere fact of the existence of successive anticlinal rolls alter the principle?

If there is no injustice in denying a locator covering the crest of one fold of a series the right to follow the vein as far as it continues on its downward course before turning up again, there is certainly no difference in real principle merely because a single anticlinal roll exists which may later prove to be only one of a series.

When the locus and existence of an apex is ascertained, and properly located with respect to the boundaries of the claim, then the title to the extralateral segment of the vein having such apex is forever quieted as between the parties to litigation, involving the existence of an apex. This is the very essence and purpose of the apex law. All sound apex decisions must harmonize with this concept. But if the doctrine contended for by opposing counsel is to receive the approval of the court, then we may be confronted with the situation illustrated by Figure 9.

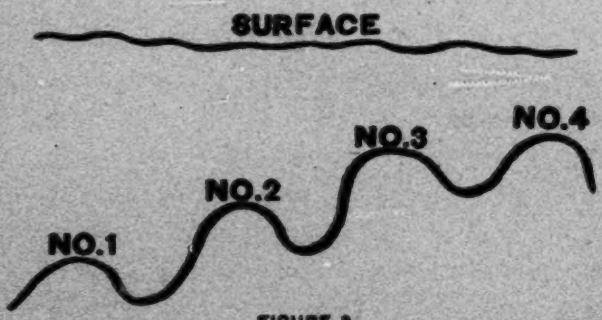


FIGURE 9

This section presents a series of crests of anticlinal rolls in an undulating vein discovered to exist in the order enumerated. If opposing counsels' contention be sound, a ruling in favor of Apex No. 1, instead of being final, and forever quieting the title, would either give way to a later discovery of Apex No. 2, or the extralateral right might be defeated altogether. And subsequently, both determinations might have to give way in favor of a determination in favor of Apex No. 3. And all three might again have to yield in favor of a determination in favor of Apex No. 4. This illustrates the inconsistencies which may arise if the doctrine of defendant in error be accepted.

Counsel for the West End Company contended in the courts below and we assume that they will make the same contention before this court that the mining laws of Congress were intended to be liberal to the prospector and discoverer. To all of this we subscribe as a generality. On the other hand, it is also manifest that a limitation must of necessity exist as to the extent of the grant to the original discoverer on the discovered vein, otherwise the discoverer would secure the entire vein, no matter what its magnitude and persistence, to the exclusion of all other locators. The ancient mining laws, as a special reward to the original discoverer, granted him a double claim, and this liberality was carried forward into our mining laws when the miner and prospector in the early days of mining in the West fashioned his own laws, based on

custom and observance, and this double grant was still later recognized in the provisions of the Act of 1866, which crystallized what has gone before (§ 4 of Act of 1866). But the framers of the Act of 1872 did not see fit to perpetuate this additional grant to the discoverer, and placed him on the same footing with all other locators as regards the size of the claim that he might locate. While the Act of 1872 is intended to be liberal to the discoverer, it does not place him in a distinct class, but he is governed by the same provisions which govern all locators.

The Act of 1872 prescribes that certain formalities shall be complied with "as conditions upon which extra-lateral rights may be acquired" and "a party must bring himself within those conditions or else be content with simply the mineral beneath the surface of the territory." This is the language of Mr. Justice Brewer in the Del Monte case (171 U. S., 55, 56).

The mere fact that the West End Company did what most mine operators in Tonopah are compelled to do, viz: to sink a shaft through a considerable depth of cap rock before encountering the vein, only entitles that company to the rights that naturally and logically result from the physical situation disclosed. The fact that they encountered an anticlinal vein without any legal apex leaves them in the same position that they would have found themselves if the vein had been a flat horizontal sheet, and they are only entitled to the ore embraced within the vertical boundaries of

their claim. That this was no inconsiderable amount is evidenced by the extensive stoping found beneath the West End surface.

II.

SECTION 2322 OF THE REVISED STATUTES DOES NOT CONTEMPLATE THE EXERCISE OF AN EXTRALATERAL RIGHT IN TWO OPPOSITE DIRECTIONS.

While a discussion of this proposition will be rendered unnecessary in the event that this court determines that the crest of an anticlinal roll is not a legal apex, yet this question assumed considerable importance in the courts below, because the main contention of the West End Company in the trial court was that the opposite dipping limbs or slopes of the anticlinal roll constituted two distinct and separate veins. The trial court in its opinion said:

> "The all-important contention of fact is whether the body of quartz, ore, etc., or the bodies of quartz, ore, etc., in the controversy constitute one vein or two. The evidence easily preponderates that it, or they, form but one vein . . ." (Transcript Vol. II, p. 633).

Though this discussion may prove unnecessary as indicated, yet it is not without its value as an analogue.

The West End discovery is admitted to have been made in the McQuillan shaft on the North dipping slope or side of the vein (Transcript, Vol. I., p. 179; Vol. II, p. 651), and consequently, the West End

extralateral right, if it have any such right, extends to the North. But here we are confronted with the fact that the slope or side of the vein embracing the ore bodies in dispute dips Southerly and in the opposite direction from the North dipping slope or segment of the vein on which the discovery was made. The question is squarely raised as to whether two extralateral rights can be predicated on the same location and exercised on the same vein or on different veins in opposite directions.

The vital part of the grant which bears on this question is contained in the language of §2322 of the Revised Statutes which confines the extralateral segments of the vein

> "to such portions thereof as lie between vertical planes drawn downward as above described, through the end lines of their locations, so continued *in their own direction* that such planes will intersect such exterior parts of such veins or ledges."

This language, we respectfully submit, only admits of the interpretation that such planes shall be extended in one direction, and that would be in the direction of the dip of the vein on which the discovery was made. If the statute bore the interpretation claimed for it by defendant, the language would have read *"in both directions."* Since it did not, the inference is clear that bifurcated, or double barreled extralateral rights were not contemplated.

Opposing counsel may seek to obtain some comfort

from that portion of the section which states that the locator of all mining locations may possess all veins throughout their entire depth, etc.,

> "although such veins, lodes or ledges may so far depart from a perpendicular in their course downward as to extend outside the vertical *side lines* of such surface locations."

They may urge that the use of the plural "side lines" gives rise to the inference that the grant of extralateral rights through two opposite side lines of the same claim was intended. It is very clear, however, that this portion of the section is dealing with "mining locations" in the plural and it would have been entirely improper from a grammatical standpoint to have made use of the term "side line" in the singular under any construction that might be placed on the statute.

Again, at the end of the portion of the statute above quoted, the following language is employed, that the locator shall not be permitted to follow his "vein or lode which extends on its downward course beyond the vertical lines of his claim" in such a manner as to enter upon the surface of other claims. Here again the plural "lines" is used and appellee will doubtless claim that this also is an express sanction for a double-barreled extralateral right. However, it will be noted that the plural is confined to the "lines" of the claim, and that the term "*side* lines" is not employed, and since it is not used, the presumption would be that

it was not used advisedly. The framers of the statute unquestionably wished the prohibition of the statute to be all-embracing, so as to prevent a claimant from entering upon the surface of another claim, whether he followed his vein downward through a side line or an end line, and it will be borne in mind that the courts have held that a claimant may follow his vein on its downward course through an end line when the apex of the vein crosses both parallel side lines of a claim.

King v. *Amy D. Silversmith M. Co.*, 152 U. S., 222, 228;
Bunker Hill-Last Chance Cases, 131 Fed., 579; 591.

A side boundary of a location may also be broken and composed of more than one line—it may consist of a series of straight lines and under such circumstances the use of the term "lines" would be highly appropriate.

It should also be noted in this connection that the word "claim" is used and not the word "location." Since the word "locations" was used in the immediately preceding portion of the statute, we must again assume that the word "claim" was used advisedly. While ordinarily, the term "claim" is synonymous

with "location," and they are frequently used interchangeably,

> *Del Monte M. Co.* v. *Last Chance M. Co.*, 171 U. S., 55, 74,

the term "claim" may embrace more than one location, and frequently a consolidation of mining locations held and worked under one ownership is held to constitute and be properly designated as a "claim."

That Section 2322, Rev. St. U. S., does not refer exclusively to the extralateral rights pertaining to a single location, and that the idea of extralateral rights arising out of a number of consolidated locations was within the contemplation of Congress when said statute was adopted, see

> *Carson City, etc. M. Co.* v. *North Star M. Co.*, 83 Fed., 658, 662-3.

See also:

> *St. Louis Smelting Co.* v. *Kemp*, 104 U. S., 636, 648;
> *Idaho M. Co.* v. *Davis*, 123 Fed., 396, 399.

Under this view of the case a "claim" as distinguished from a location may be composed of a group of many locations having as many distinct side lines, and the use of the plural word "lines" in the statute was undoubtedly employed to cover this very contingency.

In addition to the foregoing, which negatives any idea that a double extralateral grant can be justified by the language of the statute, we have positive evidence found in the statute itself that no such grant was intended. It will be observed that the statute refers to a "vein or lode which extends in its downward course beyond the vertical lines of his claim." By no possible construction can this be interpreted to mean the following of a vein on more than one downward course in one direction, for if two distinct downward courses on the same vein in opposite directions had been contemplated the statute would have been so worded.

If we consider the evolutionary history of the existing mining laws, we also find ample justification for our position that the law never contemplated that an extralateral right should be granted in two opposite directions.

Prior to the act of 1872, and under the local rules and customs the miner was entitled to but one vein. While end lines were not specifically mentioned in the statute of 1866, they were implied.

Eureka case, 4 Saw., 302, 323;
8 Federal cases, No. 4548, p. 827.

The right to follow the one vein was in the direction of its downward course. This established planes beyond which the miner could not go.

Under the act of 1866, the lode was the principal thing and the surface was in reality an incident.

Johnson v. *Parks*, 10 Cal., 447, 449;
Patterson v. *Hitchcock*, 3 Colo., 533, 544;
Walrath v. *Champion M. Co.*, 63 Fed., 553, 556.

Where the claim was included within a defined surface, as was usually the case, this surface could not be invaded for the purpose of searching for other lodes.

Atkins v. *Hendree*, 1 Idaho, 95, 99.

After patent which conveyed but the one lode—the patentee would acquire title to all subsequently discovered veins to the extent that they might be found within the vertical boundaries of his claim. This is the rule applied to placers in cases of lodes or veins discovered subsequent to the application for patent. While the law did not contemplate that any lodes existed, yet where they were unknown at the time of the application for patent, they passed by operations of law to the placer patentee to the extent they might be found within the vertical placer boundaries.

Under the Act of 1872, the vein is still the principal thing, in that it is for the sake of the vein that the location is made.

St. Louis M. Co. v. *Montana M. Co.*, 194 U. S., 235, 238.

As was said by Judge Brewer, speaking for the Supreme Court of the United States in the case of *Del Monte M. Co.* v. *Last Chance*, 171 U. S., 55, 75,

> "The location upon the surface is not made with the view of getting benefits from the use of that surface. The purpose is to reach the vein which is hidden in the depths of the earth and the location is made to measure rights beneath the surface. The area of the surface is not the matter of moment, the thing of value is the hidden mineral below."

The discovery of the vein has always been essential and it is contemplated that this should be disclosed in the discovery shaft and the direction of its course and dip ascertained. When this is done, a plane is established on the discovery vein in the direction of the dip or downward course of the discovery vein.

The courts, when dealing with secondary veins, have announced the rule that when the end line planes of a mining location are once fixed they bound the extralateral rights to all the lodes that are thereafter found within the surface lines of the location—otherwise as Judge Hawley has said:

> "End lines would have to be constructed in different directions if the separate lodes or veins found within the surface lines did not run parallel with each other."

Walrath v. *Champion M. Co.*, 63 Fed., 552, 557.

The grant of the extralateral right on these secondary veins must be defined by the original end line planes established on the discovery vein, and in the same direction. If the direction on the discovery vein is North 30° West, the patentee may have an extralateral right to such parts of such secondary veins as may be found between planes established at the termini of such veins extending North 30° West, the direction of the right on the discovery vein. An extralateral right on the reverse course of South 30° East would not be the direction of the plane which defines the extralateral right on the discovery vein.

If the statute were to be construed as liberally as to permit of an exercise of an extralateral right in two directly opposite directions on the same or on different veins, then it would be just as equitable and appropriate to grant an extralateral right through one side line, and also through an end line of the same claim. Assume that we had the apex of a discovery vein crossing an end line and passing out through a side line. Clearly an extralateral right can be exercised on this vein on its dip as it passes underneath and beyond the side line. Assume that the same vein dips out beneath and beyond an end line boundary of the same claim, at about the same angle, or to make the situation still stronger, assume that the apex of a different or secondary vein crosses both side lines

of this claim and dips out beneath the end line. This situation is illustrated by Figure 10, here inserted.

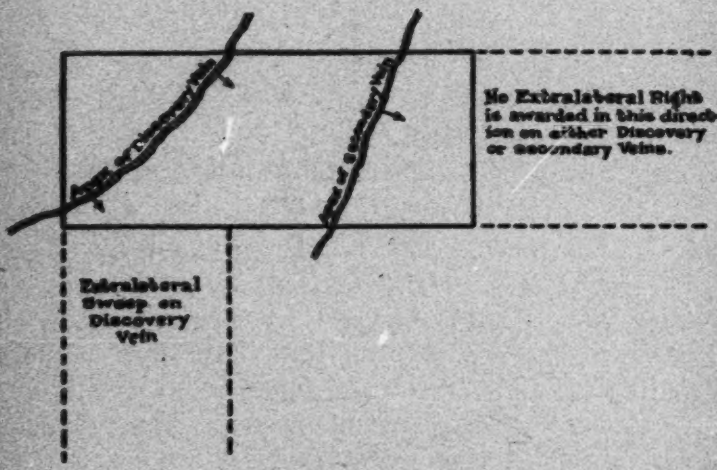

No Extralateral Rights is awarded in this direction on either Discovery or secondary Veins.
Extralateral Sweep on Discovery Vein

FIGURE 10

In either case the interpretation placed on Section 2322 by the courts will not permit the claimant to follow the same or a different vein extralaterally beneath and beyond an end line.

Conkling Mining Co. v. *Silver King Coalition Mines Company,* 230 Fed., 553, 562-3.

It may be said in answer that the courts only recognize one set of end lines, and yet the courts have already constructed side-end lines,

King v. *Amy Silversmith M. Co.,* 152 U. S., 222,

and allow end line planes on discovery and secondary veins to be fixed at entirely different points.

Ajax Gold Mining Co. v. *Hilkey* (Colo.), 72 Pac., 447;
Montana M. Co. v. *St. Louis M. & M. Co.*, 102 Fed., 430;
St. Louis M. & M. Co. v. *Montana M. Co.*, 104 Fed., 664;
Anaconda Copper Co. v. *Pilot-Butte M. Co.* (Mont.), 156 Fed., 409, 415.

Are not end line planes extending Northerly from the West End claim to be considered as utterly different and distinct from end line planes extended southerly from this claim, and if the court in its liberality permits such planes to be extended in opposite directions through opposite side lines, why should not the same liberality permit of extralateral rights through one side line and also through one end line?

This case now before the court is a striking example of the unreasonableness of a claim of the right to exercise an extralateral right on the same vein in different directions. By referring to the stereogram, Figure 2 of this brief, it will be seen that this blanket-like sheet of vein material terminates and is cut off in a Westerly direction against a capping known as Fraction Dacite Breccia, and this "terminal edge" of the vein crosses both side lines of the claim. This occurs within the boundaries of the West End claim,

so that no portion of this blanket-like anticlinal vein reaches the Westerly end boundary of the claim. This anticlinal vein sheet, considered as a whole, has a decided dip or downward course to the East, and passes through and underneath the Easterly end line of the West End claim. This condition is admirably illustrated on both of the skeleton models introduced by plaintiff and defendant respectively. Here we have what is unquestionably a terminal edge of the vein in controversy where the vein abuts up against the later rock capping. It is a buried or blind apex, from which the vein dips Easterly and passes out of the claim still continuing on a downward course to the East. Both of the essential elements of apex, "terminal edge" and "downward course" are here present. Why is it not logical to award the West End claim an extralateral right in an Easterly direction through and beyond its Easterly end line, since the terminal edge of the vein crosses both side lines of the claim? Why should not the West End claim be permitted to exercise extralateral rights both to the North and to the South based on its anticlinal apex theory, and also in a third direction to the East, based on what is unquestionably a terminal edge of the vein crossing both side lines? And assume that we had a dome-shaped occurrence of a vein existing within the boundaries of a mining claim with the vein dipping in every direction from the apex or crest of the dome. Why not award the claimant an extralateral right in four directions?

A REASONABLE INTERPRETATION OF SECTION 2322 WILL NOT PERMIT OF THE EXERCISE OF TWO EXTRALATERAL RIGHTS IN OPPOSITE DIRECTIONS BASED ON THE SAME VEIN.

While we have already pointed out that Section 2322 of the Revised Statutes contains language which does not admit of a construction that will permit of two extralateral grants attaching to the same mining location, and to the same vein and extending in opposite directions, yet if there be the slightest doubt as to the proper interpretation to be placed on this section we must bear in mind that statutes are always to receive the most reasonable and sensible construction possible, so as to avoid injustice and hardship, injury and absurd conclusions, and conform to dictates of natural reason.

Heydenfeldt v. *Daney Gold etc. Co.*, 93 U. S., 634, 638;
Law Our Bew v. *U. S.*, 144 U. S., 47, 59;
In re Chapman, 166 U. S., 661, 667;
Scottish etc. Ins. Co. v. *Bowland*, 196 U. S., 611, 629;
Jacobson v. *Mass.*, 197 U. S., 11, 39;
Low Haw Suey v. *Backus*, 225 U. S., 460, 474.

We refer to Figures 3, 4 and 5, inserted in this brief, and respectfully urge that to grant appellee's contention and permit it to exercise double-barreled extralateral rights on the single flat, blanket-like vein oc-

currence there indicated and sweep the Tonopah mining district in both directions, is to place an unreasonable interpretation on Section 2322, and would lead to unjust and unnecessary hardships.

III.

THE BROKEN END LINE OF THE WEST END CLAIM PREVENTS THE EXERCISE OF ANY EXTRALATERAL RIGHT.

Any of the plats showing the exterior boundaries of the West End claim, the patent description, and the pleadings will all indicate that the West end line of the West End claim is a broken line composed of two segments.

One of the two segments connects the Northwest corner of the claim with the Westerly end center post situated at the intersection with the lode line, and is 313.30 feet in length and has a course of N. 50° 31′ E. The other segment connects the West and center or terminus of the lode line with the Southwest corner of the claim, is 301 feet in length and has a course of N. 11° 20′ W.

This broken end line is in direct contravention of the statute which states explicitly that "The end lines of each claim shall be parallel to each other." Sec. 2320, U. S. Rev. Stats.

And Section 2322, U. S. R. S., provides that the extralateral right shall be confined by

> "vertical planes drawn downward . . . through the end lines of their locations . . ."

It is an impossibility to draw a vertical *plane* downward through this broken end line of the West End claim. The Northerly segment of the Westerly end line is parallel to the East end line of the West End claim, and opposing counsel will select this segment for the purpose of defining its extralateral rights to ignore altogether the other non-parallel segment of the Westerly end line. The statute, however, requires a vertical plane to be passed through the end line and not through a conveniently selected part of it. Counsel will also be confronted with this situation, that a vertical plane passed through the parallel segment of the Westerly end line and extended Southerly toward Jim Butler territory will pass outside of and beyond the end surface boundaries of the West End claim for the entire length of the non-parallel segment and will include a wedge of ground that is not within the limits of the West End vertical boundaries. This wedge segment abuts on to the *Westerly end* of the West End claim and lies beyond the claim in a *longitudinal* direction and cannot under any construction of the situation be termed a part of the extra-*lateral* right or right to pursue the vein *laterally*.

As was said in the Del Monte case

> ". . . the requisition that the end lines shall be parallel was for the purpose of bounding the underground extralateral rights which the owner of the location may exercise. . . . the limits of his right are not to extend on the course of the vein beyond the end lines projected downward through the earth."
>
> *Del Monte M. Co.* v. *Last Chance M. Co.*, 171 U. S., 55, 84.

It should also be noted that while this nonparallel segment of the West end line is a convergent line with reference to the East end line where veins dipping to the South are concerned, that it is a divergent line with reference to the East end line where veins dipping to the North are concerned and the discovery of the West End claim was on the North dipping slope of the vein.

It will not do for defendant to argue that its claim of extralateral right on its alleged South dipping vein does not extend as far West as the West end line of its claim. If fortuitously a vein apex crosses a straight end line and passes out of a claim or terminates within the claim some distance short of a broken end line this does not serve to rectify the situation and does not destroy the logic or law of the case. Defendant might with just as much plausibility contend that under similar circumstances its entire Western end line

can form a divergent angle with the Eastern end line or be a curved line or a broken line with no segments whatsoever parallel to the Eastern end line and still not destroy its extralateral right. The following Figure 11 will illustrate the point.

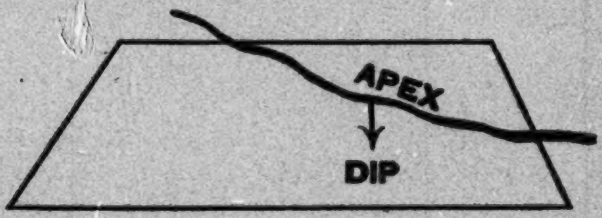


FIGURE 11

There is no inherent necessity that the end lines of a location should be parallel in order that extralateral rights may be measured, and in the illustration here presented it is manifestly a simple matter to pass a vertical plane through the point of departure of the vein apex from the claim and make it parallel to the crossed end line. But the locator has failed to comply with the specific requisition of the statute and it matters not that a rule can be devised whereby an equitable solution of his difficulties can be worked out. The law requiring strict parallelism of end lines is mandatory, so that if a locator sees fit to disobey its explicit terms and accept a patent calling for a broken end

line, he must suffer the penalty and lose his right to pursue the vein extralaterally.

Daggett v. *City of Yreka M. T. M. Co.*, 149 Cal., 357, 373; 86 Pac., 968;
Central Eureka Co. v. *E. Central Eureka Co.*, 146 Cal., 147, 152; 79 Pac., 834.

This Court has spoken definitely on the necessity of having the end lines straight and not broken and in that connection employed the following language:

"In other words, it is the end lines alone, not they and some other lines, which define the extralateral right, and they must be straight lines, *not broken* or curved ones" (p. 311) . . . *"they must be straight—no other define planes which can be continuous in their own direction within the meaning of the statute"* (p. 312).

Walrath v. *Champion M. Co.*, 171 U. S., 293, cited in *Jefferson Min. Co.* v. *Anchoria-Leland M. & M. Co.*, 75 Pac., 1070-74 (Colo.).

"In order to conform the location to the actual course of the vein or lode the side lines may be irregular, and the location is not required to be in any particular form except that the end lines must be straight and parallel to each other."

Belligerent and other Lode Mining Claims, 35 L. D., 22, 26.

See also:

Pilot Hill and other Lodes, 35 L. D., 592.

There is no excuse for the existence of the West End broken westerly end line. The Del Monte case (*Del Monte M. Co.* v. *Last Chance M. Co.,* 171 U. S., 55), expressly decided that the end lines of a location may, in order to make them parallel and comply with the statute, be placed on territory already claimed by prior locators. The Del Monte case was decided in 1897, years before the West End claim went to patent, and there is no valid reason why the doctrine announced in that case was not followed and the westerly end line of the West End claim made a straight line.

> "Congress having prescribed the conditions upon which extralateral rights may be acquired, a party must bring himself within those conditions or else be content with simply the mineral beneath the surface of his territory (p. 66). . . . Thus, for instance, there is no inherent necessity that the end lines of a mining claim should be parallel, yet the statute has so specifically prescribed (Sec. 2220). It is not within the province of the courts to ignore such provision and hold that a locator, failing to comply with its terms, has all the rights, extralateral and otherwise, which he would have been entitled to if he had complied, and so it has been adjudged" (p. 67, Del Monte case).

The Supreme Court of Nevada in its opinion below (Transcript Vol. II, p. 692) excuses the existence of

this non-parallel segment of the end line by assuming that the West End claim as originally located probably had a straight end line throughout, but the triangular area included between such assumed straight end line and the present broken segment was "excluded from the patent application because in conflict with prior existing locations." There is not one scintilla of evidence in the record to support this erroneous assumption. The court below goes on to state that the Del Monte case, above cited, permits a locator to lay his lines upon prior existing claims in order to secure parallelism of end lines, and then comes to the conclusion that if the locator does this and in his application for patent excludes these conflict areas "resulting in patented surface boundaries of irregular shape," that he still possess all the advantages he originally enjoyed before he excluded these areas.

The argument is novel and is not, we respectfully submit, supported by either logic or law. If a mining claimant sees fit to go to patent without availing himself of the privileges afforded by the Del Monte case, he most certainly is not in any position after applying for and accepting "patented surface boundaries of irregular shape," to thereafter excuse himself from the limitations imposed by his own error and show that prior to patent he had conformed to the law. In this case, be it remembered, however, that there is no evidence whatsoever upon which to base an assumption that the West End claim ever had a straight Westerly end line.

It would have been a simple matter to have established this if it had been a fact.

The existence of this broken end line is alone sufficient reason for denying any extralateral right to the West End claim.

We feel justified in asserting that we have established the following propositions:

1. That one of the essential elements of an apex is a "terminal edge" and that when the vein turns over and dips in an opposite direction, the resulting anticlinal roll has no legal apex, as is held by all the authorities that have considered the question.

2. That Section 2322 of the Revised Statues does not justify the exercise of an extralateral right on the same vein on two downward courses and in opposite directions, since the wording of the statute will not permit of such a construction. This is especially true where the limb of the vein on which the discovery was made dips in the opposite direction from the limb in which the disputed ore bodies occur.

3. That the westerly end line of the West End claim is a broken line, which is in contravention of the mandatory provision of the statute requiring end lines to be parallel and necessarily straight.

In a camp like Tonopah, with its deeply capped veins and extensive faulting, the extralateral right

law is a misfit and to unnecessarily extend its scope in such a camp will result in untold and unforeseen hardships to other operators who have expended large sums of money in good faith.

We respectfully submit that the judgment should be reversed with direction to the trial court to enter judgment for plaintiff in error and to take such other and further proceedings in the cause as may be equitable and proper.

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In the Supreme Court of the United States

October Term, 1917.

No. 249.

JIM BUTLER, TONAPAH MINING COMPANY, A CORPORATION,
Plaintiff in Error,
vs.
WEST END CONSOLIDATED MINING COMPANY, A CORPORATION,
Defendant in Error.

Brief of Defendant in Error.

At the outset we invite the court's attention to the following facts which, if not conceded by plaintiff in error, are not (in light of the findings of fact made by the trial court, unchallenged by any assignment of error) open to controversy in this tribunal.

I.

The West End patented mining claim is the property of the defendant in error.

II.

That there is a vein or lode in said claim which at its top, that is, at the line or plane where in its upward course it ceases or terminates, crosses the easterly located end line of the claim and thence traverses the same in a northwesterly direction for a distance of 1142½ feet, at which point it departs from the claim over the northerly side line thereof.

III.

That this vein has a dip in a southerly direction and in its southerly downward course so far departs from the perpendicular as to pass beyond the southerly side line of said claim and into and beneath the surface of the Eureka and Curtis claims, the property of plaintiff in error.

IV.

That all of the ore bodies in controversy belong to and are a part of this vein and all such are embraced between planes, one drawn vertically downward through the east end of the claim, extended indefinitely southerly in its own direction, and another parallel thereto, drawn through a point where the vein at its top or summit crosses the northerly side line of the claim as aforesaid. (It has long been settled law that where a vein at its top or apex crosses an end line and a side line of a claim, the owner is entitled to follow the same throughout its enitre depth between vertical planes drawn, one through the end line so crossed, and the other parallel thereto

through the point where the vein departs from the claim over the side line.) *(Del Monte M. & M. Co.* vs. *Last Chance M. & M. Co.*, 171 U. S. 55, 86-91.)

It would seem, therefore, that these ore bodies belong to and are the property of defendant according to the plain letter of Section 2322 U. S. Revised Statutes, which provides as follows:

> "The locators of all mining locations heretofore made or which shall hereafter be made, on any mineral vein, lode, or ledge, situated on the public domain, their heirs and assigns, * * * so long as they comply with the laws of the United States, and with state, territorial, and local regulations not in conflict with the laws of the United States governing their possessory title, shall have the exclusive right of possession and enjoyment of all the surface included within the lines of their locations, and of all veins, lodes, and ledges throughout their entire depth, the top or apex of which lies inside of such surface lines extended downward vertically, although such veins, lodes, or ledges may so far depart from the perpendicular in their course downward as to extend outside the vertical side-lines of such surface locations. But their right of possession to such outside parts of such veins or ledges shall be confined to such portions thereof as lie between vertical planes drawn downward as above described, through the end-lines of their locations, so continued in their own direction that such planes will intersect such exterior parts of such veins or ledges," etc.

Plaintiff in error, however, denies the right of defendant to pursue this vein in its southerly downward course extralaterally and bases its denial upon the following grounds:

1. That even within the extended end line planes of a lode claim, the locator cannot have extralateral rights in opposite directions, either upon one and the same, or upon two separate and distinct veins; that if, for instance, a location which is laid in an easterly and westerly direction covers and includes within its surface boundaries extended downward vertically the tops or apices of two separate and distinct veins, one the discovery, the other a secondary vein, the former dipping northerly, the latter southerly, the locator can have no extralateral right whatever upon the secondary vein, notwithstanding it, as well as the discovery vein, at its top or apex, traverses the claim from end to end. And that in the case of a location upon a vein which is found in the form or shape of a single anticlinal fold, if the location is based on a discovery made at some point on the northerly limb or side thereof, the locator can be awarded no extralateral right whatsoever upon the southerly side or limb, notwithstanding the location is so laid as to cover the entire width or axis of the lode from end to end.

2. That the vein or lode here involved is found in the form of a single anticline, the crest or axis of which crosses the easterly end line of the West End claim and thence traverses the claim in a northwesterly direction to a point where it crosses the northerly side line thereof; that one side or limb of the anticlinal fold dips northerly and the other southerly, and that a vein or lode in such form has no top or apex within the meaning of the law.

3. That the westerly boundary of the West End claim is not a straight, but a broken line, not parallel

throughout to the east end line of the claim; hence, the owner of the claim is not entitled to extralateral rights on any vein whatever, the top or apex of which may be found within the surface boundaries of the claim extended downward vertically, and this because Section 2320, United States Revised Statutes, provides that the end lines of each claim shall be parallel to each other.

We will consider these propositions in the order in which they are here stated.

I.

We submit that the first of these contentions, namely: that even within the extended end line planes of a lode claim the locator cannot have extralateral rights in opposite directions, either upon one and the same, or upon two separate and distinct veins, is repugnant to the plain letter and obvious spirit and intent of Section 2322 above quoted. The statute says:

> "The locators of all mining locations * * * made on any mineral vein, lode or ledge * * * their heirs and assigns * * * shall have the exclusive right of possession and enjoyment * * * of all veins, lodes, and ledges throughout their entire depth, the top or apex of which lies inside of such surface lines extended downward vertically, although such vein, lodes, or ledges may so far depart from the perpendicular in their downward course as to extend outside of the vertical side lines of such surface locations."

Plaintiff says:

> "No, not all, but such only the downward courses of which are in the same general direction as that of the discovery vein."

The statute cannot be so restricted or limited without interpolating words which are not found therein. This, we submit, is not within the province of the judiciary. Where the language of a statute is clear and unambiguous, it is its own expositor and the courts have no choice but to give effect to the law as it is written. And this is especially true where the statute, if administered in accordance with the clear import of its terms, would lead to no injustice or result in no absurdity.

In *McCluskey* vs. *Cromwell*, 11 N. Y. 593, the court, at page 601, says:

> "It is beyond question the duty of courts in construing statutes to give effect to the intent of the law-making power and seek for that intent in every legitimate way. But * * * first of all in the words and language employed, and if the words are free from ambiguity and doubt and express plainly, clearly and distinctly the sense of the framers of the instrument, there is no occasion to resort to other means of interpretation. It is not allowable to interpret what has no need of interpretation."

This fundamental rule has been repeatedly announced by this Honorable Court and it is needless to multiply citations in support of it.

In the brief of plaintiff in error, at page 30, it is said:

> "The vital part of the grant which bears on this

question is contained in the language of Section 2322 of the Revised Statutes which confines the extralateral segments of the vein

"'to such portions thereof as lie between vertical planes drawn downward as above described, through the end lines of their locations, so continued *in their own direction* that such planes will intersect such exterior parts of such veins or ledges.'

"This language, we respectfully submit, only admits of the interpretation that such planes shall be extended in one direction, and that would be in the direction of the dip of the vein on which the discovery was made. If the statute bore the interpretation claimed for it by defendant, the language would have read *'in both directions.'* Since it did not, the inference is clear that bifurcated, or double barreled extralateral rights were not contemplated."

We confess our inability to discover any force in this suggestion of our learned friends. A straight line may be said to have two directions. If a line were drawn due north and south, an observer standing at the northerly terminus and looking toward the other end would naturally say that the direction of the line was south. Another observer standing at the southerly terminus and looking toward the opposite end would naturally say that the direction of the line was north.

The east end line of the West End claim, for instance, is laid in a northerly and southerly direction. If we start at the southeast corner of the claim and travel to the northeast corner we proceed in a northerly direction; while, if we start at the northeast corner and travel to

the southeast corner, we are following the line in a southerly direction. If that end line were continued northerly in its own direction for a distance, we will say, of 500 feet, and also continued southerly in its own direction for a like distance, the direction of the line would not be changed, of course; and if a vertical plane were passed through the end line thus extended, we would have but one plane and it would be a plane in the direction of the easterly end line of the claim continued.

From the language of the section here under discussion, it is manifest that Congress recognized that within the surface boundaries of a claim there might be found the top or apex of more than one vein, and it must have been foreseen by Congress that if there were two or more such veins, the dip or downward course of each of the secondary veins might be in a direction quite different—even opposite—from that of the discovery vein. The downward course of one and the same vein may differ widely as it is followed to the deep from level to level by mine workings. (This is recognized in *First Lindley on Mines*, Section 319, at page 724.)

The Rainbow lode in Butte-Montana is found, where the Elm Orlu claim is laid upon a portion of its apex, dipping in a southerly direction from its top or outcrop to the 800 foot level, at or about which depth it changes from a southerly dip or downward course to the vertical, and then in a short distance changes again to a northerly dip, with an angle of less than 50 degrees from the horizontal; it is followed down to the 1300 level or thereabouts, where it is again found in a vertical position.

We are informed, and we believe correctly, that the great Comstock lode in Nevada, especially in the vicinity of the Ophir and contiguous claims laid upon it, dipped from its outcrop westerly for some hundreds of feet, and then changed to a pronounced easterly dip.

The late Senator Stewart of Nevada, who, we understand, was the author of the Act of 1872, was a mining lawyer of eminence and of large experience in lode mining in the western states, and must have been familiar with the striking irregularities found in veins, not only longitudinally, but in their downward course; and had the intent been to limit the extralateral right on secondary veins to those the downward course of which was in the same direction as that of the discovery vein, language, of course, would have been employed expressive of that intent, instead of the all-comprehensive words of the section, "all veins, lodes and ledges throughout their entire depth the top or apex of which lies within such surface lines," etc.

In *Iron Silver Mining Co.* vs. *Elgin Mining Co.*, 118 U. S. 196, it is said at page 207:

> "It often happens that the top or apex of more than one vein lies within such surface lines, and the veins may have different courses and dips; yet his right to follow them outside of the side lines of the locations must be bound by planes drawn vertically through the same end line."

In *Del Monte M. & M. Co.* vs. *Last Chance M. & M. Co.*, 171 U. S. 55, it is said at page 88:

> "* * * we find from Section 2322 that he is entitled to 'all veins, lodes, and ledges throughout

their entire depth, the top or apex of which lies inside of such surface lines extended downward vertically.' Every vein whose apex is within the vertical limits of his surface lines passes to him by virtue of his location. He is not limited to only those veins which extend from one end line to another, or from one side line to another, or from one line of any kind to another, but he is entitled to every vein whose top or apex lies within his surface lines. Not only is he entitled to all veins whose apexes are within such limits, but he is entitled to them throughout their entire depth, 'although such veins, lodes, or ledges may so far depart from a perpendicular in their course downward as to extend outside the vertical side lines of such surface locations.' In other words, given a vein whose apex is within his surface limits, he can pursue that vein as far as he pleases in its downward course outside the vertical side lines. But he can pursue the vein in its depth only outside the vertical side lines of his location, for the statute provides that the 'right of possession to such outside parts of such veins or ledges shall be confined to such portions thereof as lie between vertical planes drawn downward as above described, through the end lines of their locations, so continued in their own direction that such planes will intersect such exterior parts of such veins or lodes.'"

And at page 88-90:

"Our conclusions may be summed up in these propositions: First, the location as made on the surface by the locator determines the extent of rights below the surface. * * * Third, every vein 'the top or apex of which lies inside of such surface lines extended downward vertically' becomes his by virtue of his location, and he may pursue it to any depth beyond his vertical side

lines, although in so doing he enters beneath the surface of some other proprietor."

And in *Calhoun Gold Mining Co.* vs. *Ajax Gold Mining Co.*, 182 U. S. 499, this court, at pages 508-9 (referring to Section 2322) says:

"* * * There are no exceptions to its language. The locators 'of any mineral veins, lode, or ledge' are given, not only 'an exclusive right of possession and enjoyment' of all the surface included within the lines of their locations, but '*of all veins, lodes, and ledges throughout their entire depth*, the top or apex of which lies inside of such surface lines extended downward vertically.' A locator, therefore, is not confined to the vein upon which he based his location and upon which the discovery was made. 'All veins or lodes having their apices within the plane of the surface lines extended downward are his, and possession of the surface is possession of all such veins or lodes within the prescribed limitations.' Barringer & Adams, Mines & Mining, page 44.

* * * * * * *

"And this court said, speaking by Mr. Justice Brewer, in *Campbell* vs. *Elliot*, 167 U. S. 116, 42 L. Ed. 101, 17 Sup. Ct. Rep. 765:

"'But the patent is not simply a grant of the vein, for, as stated in the section, 'a patent for any land claimed and located for valuable deposits may be obtained in the following manner.' It must also be noticed that Section 2322, in respect to locators, gives them the exclusive right of possession and enjoyment of all the surface within the lines of their locations, and all veins, lodes, and ledges, the tops or apices of which are inside such lines. So that a location gives to the locator something more than the right to the vein which is the occasion of the location.' * * *

> "The only condition is that the veins shall apex within the surface lines. It is not competent for us to add any other conditions. Blind veins are not excepted, and we cannot except them. They are included in the description 'all veins' and belong to the surface location."

There are many decisions, both state and federal, in which identical expressions are found.

So far as we have been able to discover, it has never occurred to any court, in any case, that the provision of the statute granting to the locator the ownership and enjoyment of all veins throughout their entire depth the tops or apices of which are found within the surface lines of his claim, needed any such qualification as plaintiff is here insisting upon. To no court, apparently, has the thought ever occurred that in order to have an extralateral right upon the secondary vein or secondary veins the downward course of such secondary vein or veins must be in the same general direction as that of the discovery vein. We feel justified in saying that in no case will there be found even a hint that any such limitation would be permissible under the language of the Act. Neither in the text of any of the text writers is there found any intimation, so far as we have been able to discover, that such a limitation could be placed upon the statute by interpretation.

Again, as has been said by many courts, including the Supreme Court of Nevada in the instant case, the intent and purpose of Congress in this legislation was to encourage the search for and the development of the

mineral wealth of the nation. The statute should be so administered as to further this end.

Now, we will assume that in a lode location laid in an easterly and westerly direction there are found two separate and distinct veins, each of which at its top or apex and on its course traverses the claim lengthwise thereof from end to end—one, the discovery vein, we will say, dipping northerly, and the other, a secondary or subsidiary vein, dipping southerly. The development of the wealth of the latter was due to the energy and enterprise of the locator of the claim. To award him extra-lateral rights thereon would be to encourage the development of the mineral resources of the district, and a decision upholding his right to pursue this vein throughout its entire depth between the end line planes of his location would give effect to the plain letter of the law. It is as clearly embraced within the language of the Act—"all veins, lodes, and ledges," etc., as is the discovery vein itself. On the other hand, the effect of a decision upholding the contention of plaintiff in error would be not to encourage, but to retard development, and such a decision also would be as plainly inequitable as it would be violative of the plain letter of the statute. It would deny the locator through whose energy the vein was found and developed, the right to follow it beyond a vertical plane passed through the southerly side line of his location: all the balance of the vein in its downward course would be handed over to his neighbor, who is not only a stranger to its discovery, but who never expended a dollar in its development; moreover, neither this neighbor nor any

other citizen could ever make a valid location based upon it, for no location could be made thereon which would include the top or apex of the vein. And, as said in *First Lindley on Mines,* Section 31, page 111:

> "Under the Act of 1872 the miner locates a surface, which must be so defined as to include the top, or apex, of his lode. Failing in this, he obtains nothing. If he mistakes the course of his vein, it is his loss. He can only hold the vein on its course to the extent that the top, or apex, thereof is found within his boundaries. He may thus acquire a superficies fifteen hundred feet in length by six hundred feet in width, if local regulations do not restrict these measurements.
>
> "In other words, under the old law he located the *lode.* Under the new, he must locate a piece of land containing the top, or apex, of the lode. While the vein is still the principal thing, in that it is for the sake of the vein that the location is made, the location must be of a piece of land including the top, or apex, of the vein."

This passage from Lindley has been quoted by this court with approval in the case of *Calhoun Gold Mining Co.* vs. *Ajax Gold Mining Co.,* 182 U. S. 499, 508, and again in *St. Louis M. Co.* vs. *Montana M. Co.,* 194 U. S. 235, 238.

Sketch No. 1, opposite page, illustrates another situation which might be encountered if plaintiff's contention were to receive the sanction of this court.

(Owing to the marked irregularities which are often found in the downward course of a vein, the situation depicted on the diagram is one which may frequently be developed or encountered. By the provisions of U. S.

Sketch 1.

NORTH
VERTICAL
CROSS SECTION
OF VEIN.
A
Surface
North Side Line of Location extended vertically
downward from point where cut by plane of section.
VEIN
South Side Line of Location extended vertically
downward from point where cut by plane of section.
B
C

Revised Statutes, Section 2320, the width of a lode location may be by local rules and regulations of miners, limited to not more than 25 feet on each side of the center of the vein at the surface, and it is common knowledge that in many districts these rules and regulations do limit the width to 100 feet on each side.)

On the diagram is shown the downward course of a vein in cross section; also the vertical downward course of the northerly and southerly side lines, of a location laid upon the vein at its apex, from the points where these lines are, respectively, cut by the plane of section. There is but one vein, to-wit: the discovery vein; it has its top or apex within the surface lines of the claim, and, as cut by the plane, is found at the point marked "A." Now, in its downward course this vein extends southerly from its apex to and across the southerly side line of the location to the point marked "B," from which point its downward course is found to be northerly until it crosses the northerly side line of the claim at the point marked "C."

Under plaintiff's contention the locator of this vein would lose it when it passes through the northerly side line of the claim at point "C." His extralateral right would already have been exercised southerly, and we are told that it cannot, in any event, be exercised in the opposite direction. The locator who discovered and developed it would lose his right to pursue it beyond a vertical plane passed through his northerly side line. And yet, no one could make a valid location based upon that por-

tion of the lode found in its downward course northerly of that line.

We confidently submit that no such result as this could have been within the contemplation of Congress. It is a result, moreover, which cannot be reached without disregarding the clear and explicit language of the statute. Assuming that the court will give effect to the law as it is written, we pass to the consideration of another subject.

II.

We are brought now to a discussion of another of plaintiff's contentions, namely, that in all cases, under all circumstances, no matter what the form or shape of an ore body may be, it can have no top or apex within the meaning of the law, unless it is found where it terminates in its upward course in the form or likeness of a terminal edge; that the words "top" and "apex" imply *a terminal edge*, and therefore no vein in the form of a single anticlinal fold can have a top or apex within the meaning of the law. The term "terminal edge" as descriptive of the top or apex of a vein, is not found in the Act of Congress. It is true, however, that in a number of cases it will be found that the courts generally in instructions given to juries as to what is meant by the top or apex of a vein, have spoken of it as the "terminal edge thereof," or "where the vein is found at or nearest to the surface as it is followed in its upward course." In other cases the top or apex has been defined as "the highest or terminal point of the vein" or "where it approaches nearest the

surface of the earth and where it is broken on its edge so as to appear to be the beginning or end of the vein." Such expressions or definitions of top or apex, as used in the Act, are altogether apt and free from criticism as applied to the vast majority of veins or lodes, for with rare exceptions veins are found to occupy a position in the mass of the mountain between the horizontal and the vertical, as though standing on edge, and of course the top or apex of every such vein would present the appearance of a terminal edge as though it were the end or the beginning of the vein.

But the rule is fundamental that any language found or expression used in a decision of any court is to be read, understood and applied in the light of the facts of the particular case with which the court is dealing. As said by Chief Justice Marshall, in the celebrated case of *Cohen* vs. *Virginia*, 6 Wheat., at p. 399:

> "It is a maxim not to be disregarded that general expressions in every opinion are to be taken in connection with the case in which those expressions are used. If they go beyond the case they may be respected, but ought not to control a judgment in a subsequent suit when the very point is presented for decision. The reason of this maxim is obvious. The question actually before the court is investigated with care and considered in its full extent. Other principles which may serve to illustrate it are considered in their relation to the case decided, but their possible bearing on all other cases is seldom completely investigated."

And in *Parsons* vs. *District of Columbia*, 107 U. S. p. 45, the court says:

> "It is trite to say that general principles announced by courts which are perfectly sound expressions of the law under the facts of the particular case may be wholly inapplicable in another and different case."

And again, Chief Justice Marshall, in *Ogden* vs. *Saunders*, 12 Wheat. 198, in a dissenting opinion, but not dissenting upon this question, said:

> "It is a general rule expressly recognized by this court that the positive authority of a decision is co-extensive only with the facts on which it is made."

See also:

French v. *Barber Asphalt Paving Co.* (U. S.), 45 Law Ed., at page 898;

Hans v. *Louisiana*, 134 U. S., pp. 1, 20;

Leisy v. *Harden*, 135 U. S. 100, 134-5;

Northern Bank v. *Porter Township*, 110 U. S. 608, 615;

Fidelity Trust Co. v. *Gill Car Co.*, 25 Fed. 737, 748;

Southern Railway Co. v. *Simpson*, 131 Fed. 705, 709;

St. Louis L. M. & S. Ry. Co. v. *Davis*, 132 Fed. 629, 635;

Mayor v. *Erhardt*, 88 Ill. 452, 457;

In re Johnson, 98 Cal. 531, 541-2;

Ex parte Young Ahgow, 73 Cal. 438, 448-450;

Hart v. *Burnett*, 15 Cal. 530, 598-9.

We know of no case where a court has heretofore been called upon to define or determine what, within the meaning of the Act, is to be regarded as the top or apex of a vein or lode, having the form of a single anticlinal fold.

Such a deposit is a vein or lode within the meaning of the Act of Congress. As said by Hallett, Judge, in *Stevens* vs. *Williams,* 23d Fed. Cases (No. 13,414), at p. 45:

> "It has been decided that Congress, in passing this Act, intended by this description to embrace and include all forms of deposit which are located in the general mass of the mountain."

See, also, *Hyman* vs. *Wheeler,* 39 Fed. 347, 355, and *Iron Silver Mining Company* vs. *Cheesman,* 116 U. S. 529, 535.

It must have a top in the nature of things, else we have a vein with sides, ends, two bottoms and no top. As said in *2nd Lindley,* Section 309, at p. 686:

> "As absolute horizontality does not exist in nature, every vein, lode or deposit, whatever its form, has either an upper and lower edge or a top and a bottom, as well as sides. It may be difficult to find them, or to determine their relative position, but they exist, in the nature of things."

No arbitrary definition of the words "top" or "apex" can be adopted, perhaps, which would be applicable to all cases, any more than a definition of the word "vein" itself could be adopted which would be universally applicable.

In *1st Lindley*, Section 289, at page 644, the author says:

> "We do not conceive that from a judicial standpoint it is a matter of vital importance that the miner and the scientist should harmonize their differences on the subject of mere definition. The danger lies in accepting the definition of either as broadly comprehensive or rigidly restrictive, and attempting to apply them to conditions not within the reasonable contemplation of the law, or in attempting to deprive a locator of the benefit of his discovery, if the thing discovered cannot be forced into the mold of arbitrary definition, either popular or scientific."
>
> "If in the construction of the terms used in the mining laws there is one evil to be avoided as great as the servile adherence to arbitrary definition, it is the blind application of a rule announced in one case, where local conditions may justify it, to other cases, where a similar application of the rule, by reason of modified or totally different conditions, would produce absurd results.
>
> "'Many definitions of veins have been given, varying according to the facts under consideration. The term is not susceptible of arbitrary definition applicable to every case. It must be controlled, in a measure at least, by conditions of locality and deposit.' (Citing *Beals* vs. *Cone*, 27 Colo. 473.)"

And Judge Hawley, in *Book* vs. *Justice Mining Co.*, 58 Fed. 106, 121, says:

> "Various courts have at different times given a definition of what constitutes a vein, or lode, within the meaning of the Act of Congress; but the definitions that have been given, as a general rule, apply to the peculiar character and formation of the ore deposits, or vein matter," etc.

Again, the word "top," as used in the Act of Congress, is to be understood in its popular sense. The word had no place in the vocabulary of the miner. Its first use, in connection with the term "vein" or "lode" is found in the Act.

See *Duggan* vs. *Davey*, 26 N. W. 887;

Stevens vs. *Williams*, 1st Morrison's Mining Reports, 557, 561.

"Words in common use and not technical, employed in a statute, which is intended to be understood and practiced upon by the people, should be construed according to their popular meaning; that such was the intention of the Legislature is the only intendment that ought to be adopted."

Sutherland on Statutory Construction, Sec. 257.

Even where a word, found in a statute, has a technical or scientific as well as a popular meaning, the author says:

"* * * the courts will accord to it its popular signification, unless the very language of the subject indicates, or the context suggests, that it is used in its technical sense."

Sutherland, Sec. 250.

In the case of *Brewer* vs. *Harris*, 5 Grat. 298, the court said:

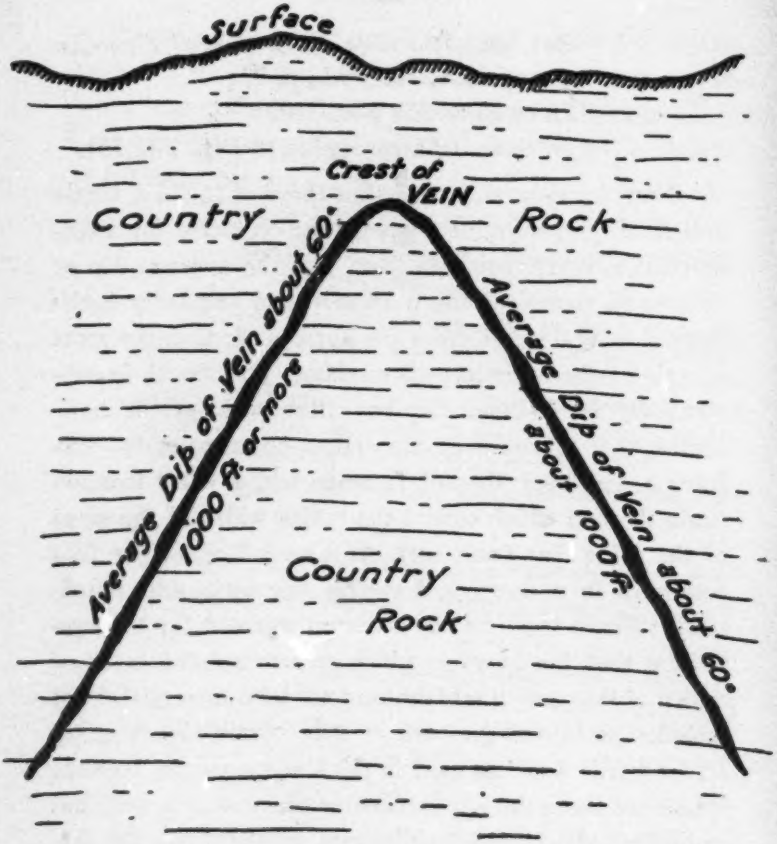
"In the use of language not technical, the legislature must be supposed to express their meaning according to the sense in which it will be understood by the persons for whom they legislate."

See *Gross* vs. *Fowler*, 21 Cal. 393, 396-7;

See, also, *Corning* vs. *Board of Commissioners*, 102 Fed., p. 57;
In re Ellis, 179 Fed. 1002;
U. S. vs. *Chesebrough*, 176 Fed. 778, 781.

Now, let it be supposed that there is found a single anticlinal vein coursing easterly and westerly for a distance of several thousand feet; that the average dip or downward course of the northerly and southerly limbs thereof is 60 degrees from the horizontal; that the crest or axis of the anticline throughout its length is substantially level, departing but slightly from the horizontal; that this crest is exposed or outcrops at the surface; a discovery thereof is made and a valid location made thereon which covers the entire width of the crest of the fold; that from such crest each limb of the fold continues in a downward course regularly and indefinitely; would there be any rational warrant for the contention that the location which so covered the crest or crown of this anticlinal vein was not laid upon or did not include the top of the vein or lode within the meaning of the word "top" as used in the statute, simply because it had not there the appearance or likeness of a terminal or broken edge? On the diagram, Sketch 2, on the following page we show a cross section taken through such a vein. Now, let it be supposed that each side or limb of such a vein has been developed to a depth of 1000 feet or more and for the full length of the claim in which it is found, or 1500 feet, and that the cross section shown on the diagram is fairly representative of the form or shape of the vein from end to end; if a layman, a miner or,

Sketch 2.


Surface
Crest of VEIN
Country Rock
Average Dip of Vein about 60°
1000 ft. or more
Average Dip of Vein about 60°
about 1000 ft.
Country Rock

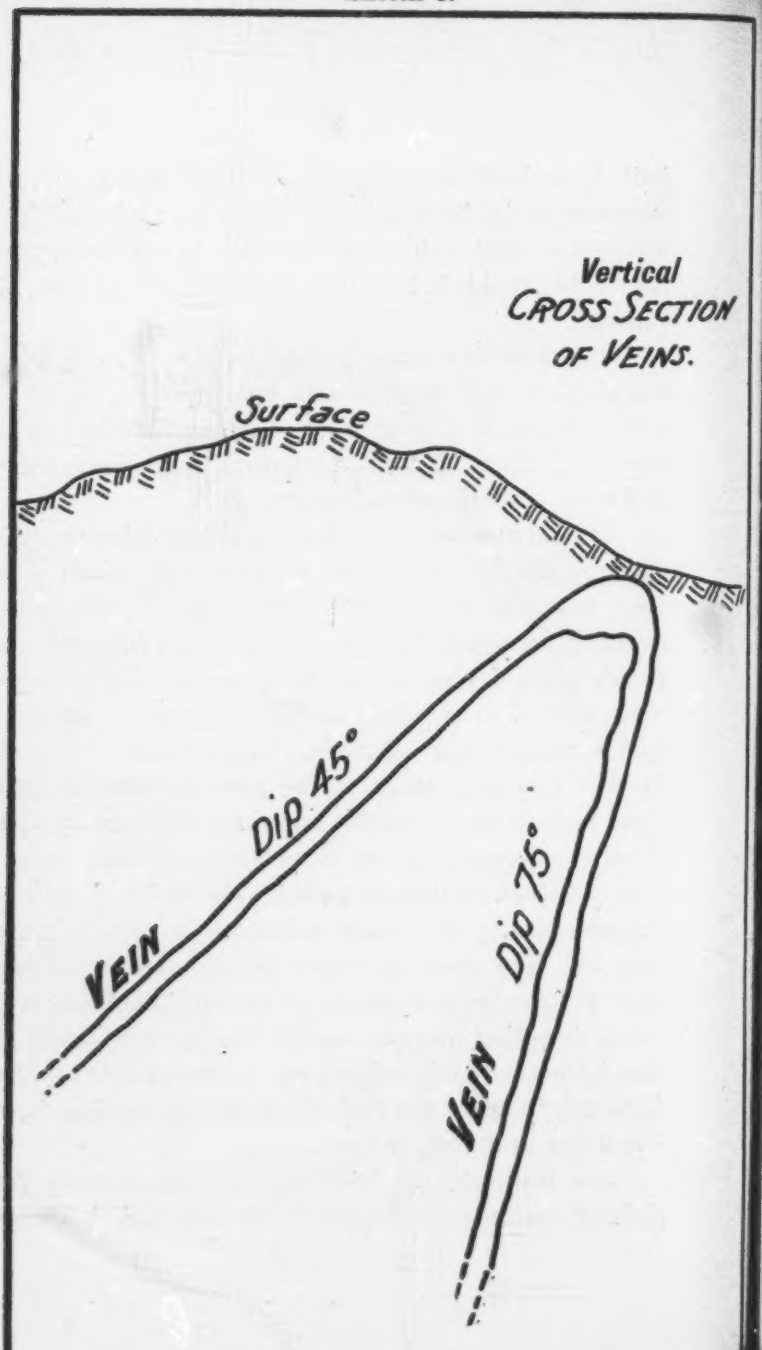
indeed, anybody but a highly educated expert, carried away by zeal in the cause of his client, were asked to designate the top of such a vein, can there be any doubt that his reply would be? "Why, the crest of the roll, of course."

Again, let us suppose that we have two fissure veins coursing, we will say, easterly and westerly, the more northerly one at an angle of 45 degrees, the other of 75 degrees. (Sketch No. 3, on following page, shows these two veins in vertical cross sections.)

(And here we direct the court's attention to testimony in the case free from conflict, from which it is made to appear that the wall rocks or the country rocks, so-called, in which the vein or veins here involved are found, were, during the period when the vein or veins were formed or created, soluble and readily attacked by the mineralizing solutions which circulated through fissures affording channels for their circulation; that these rocks being permeable and easily attacked by such solutions, were *pari passu* in the process of vein formation, dissolved particle by particle, and replaced particle by particle with the metals and minerals carried in the solution. The extent to which this process of replacement was carried is evidenced by the fact that today it is found that what was once barren country rock has been thereby not only mineralized but converted into ore for distances from the channel of circulation varying from 5 or 6 feet to 40 feet, or more.

See testimony of *Professor Lawson,* witness for plaintiff, on cross-examination, Transcript, Vol. II, pp.

Sketch 3.


Vertical
CROSS SECTION
OF VEINS.
Surface
Dip 45°
VEIN
VEIN
Dip 75°

597-598; *Chandler,* witness for defendant, Transcript, Vol. I, pp. 130-1; *Jussen,* witness for defendant, Transcript, Vol. I, pp. 107-8; *Wiley,* witness for defendant, Transcript, Vol. 1, pp. 39 and 51; and *Searles,* witness for plaintiff, Transcript, Vol. II, pp. 536-7.)

In their course upward these veins, of course, approach each other and at or beneath the surface form a union and the wall rock, being soluble, has been converted into ore so that at and for some distance below the junction of the two the ore extends from the one to the other uninterruptedly and at the plane of juncture and for some distance beneath the same there is the appearance of one vein only, the top of which does not appear as a "terminal" edge, but is in the form of a crest or dome. We will say that that condition exists throughout the entire length of the claim, and that below the plane of juncture or below the plane where we have the appearance of but one vein at the top or summit, each has been followed to the deep for more than 1,000 feet, going down with all the regularity found in the most regular of veins. Now, if one were asked where the top of that vein or those veins was, could there be any other answer than one, namely, the summit of the two, the dome or crest of the two? If this crest or summit of these two veins cannot be treated and regarded as the top or apex because it is not there found in the likeness of a terminal edge, the conclusion, of course, is inevitable, and as irrational as it is inevitable, that neither of these veins has any top or apex within the meaning of the law. Neither of them is

horizontal and both of them have a decided dip or downward course. They are lodes or veins within the meaning of the law, for the statute applies and was intended to apply, as we have seen, to all veins or lodes, no matter what the form or shape of the same might be. And yet, under appellant's contention, the citizen who discovered this vein at its summit and made a valid location thereon covering such crest from end to end, must be denied the right to pursue either of the two extralaterally because being united at and for some distance below their summit or nearest approach to the surface, neither there presents to the eye the appearance of a terminal edge and therefore neither of them has any top or apex. (Of course no one can follow any vein extralaterally, the top or apex of which is not found within the surface boundaries of his claim.) We submit that a contention which leads to such an absurd and inequitable result, ought not to, and we cannot believe will, receive the endorsement of the court.

In this illustration we have neither a vein in the form of a single anticline with opposite dipping limbs, nor have we two veins with separate tops or apices dipping in opposite directions. We have two veins, the downward course of both being in the same general direction, which in their upward course have united and the ores of the two at the plane of union and for some distance below are intermingled—by the process of replacement the soluble wall rock has itself been converted into ore for some distance from the channel of circulation, so that at the summit of the two and for some distance below,

there is apparently but one vein, and that not in the form of a terminal edge but in the form of a crest. According to plaintiff's contention, the citizen who has located a mining claim so as to cover this crest in its entire width from end to end of the claim, can have no extralateral right upon either vein, and this for the reason, solely, that neither, where it terminates in its upward course, is found in the likeness of a terminal edge. Notwithstanding the language of the Act secures to the locator all veins throughout their entire depth, the tops or apices of which lie within his surface lines, the court is here asked by plaintiff in error to conclude and decide that it was the intention of the author of the bill and of Congress in enacting it, that one who had discovered such an ore deposit at its crest or summit and made a valid location thereon covering the width thereof throughout the length of his location, should be denied the right to follow either of the veins in its downward course beyond his vertical boundaries, and this simply because neither in its upward termination had the appearance of a terminal edge. It is an undue tax upon one's credulity to ask him to believe that it was the intention of the law-maker that whether the citizen who had discovered and developed a vein or lode should be denied, or permitted to enjoy, the fruits of his skill, industry and energy, would be made to depend upon the flimsy distinction plaintiff insists upon, to-wit: the appearance, shape or form of his vein where it terminates in its upward course, whether at or beneath the surface. With

respect and deference to our learned friends, their contention in this regard, we submit, borders upon the preposterous, and must be rejected. If it must be rejected, it follows, necessarily, that plaintiff's contention that the crest of a vein in the form of a single anticline cannot be regarded as the top, that a vein in such form has no top or apex because it has no terminal edge, must also be held to be untenable.

To further test the soundness, or to disclose the fallacy, in this contention of plaintiff: We will suppose that we have two parallel fissure veins coursing easterly and westerly, one dipping to the north, the other to the south; that these veins traverse the country for a distance of 5000 feet or more; that throughout the extreme westerly 1500 feet both veins are found at the surface, each having its independent top or apex, the distance between the two being, we will say, 25 feet; that throughout the next 1500 feet easterly we find that the two veins in their upward course have intersected or united, the country rock being permeable, soluble and readily acted upon by the mineralizing solutions which found their channel or circulation through the two fissures, has been converted into ore at the summit of the two and downward for some distance below the same so that we have here the appearance of one vein only at the surface or at the outcrop or wherever the summit or top is found, whether at or below the surface, the top or summit where the two veins are thus united being in the form of a crest; then we will suppose that throughout the next 1500 feet easterly, as the result of erosion, we again find these two

veins at the surface as separate veins, each having its own independent top or apex.

Now, we will suppose that Mr. Smith has laid a location on the extreme westerly 1500 feet, a location which covers the top of both of these separate veins, the one dipping to the north and the other to the south. (We believe we have already demonstrated that under the law he would have the right to follow both of them indefinitely to the deep between his end line planes extended.) Mr. Brown makes a location on the extreme easterly 1500 feet where again, as the result of erosion, we have the two veins coming to the surface, each having an independent top or apex; Mr. Brown's location covers the top or apex of both. He likewise has the right to follow both of these veins indefinitely to the deep. But Mr. Jones has laid his location between that of Smith and Brown, on that portion of the two veins where they have intersected or united, thus giving at the outcrop or at the summit of the two the appearance of but one vein which is there found in the form of a crest. He, if there be any justification for appellant's contention, has no extralateral rights whatever on either vein.

It is unbelievable, we submit, that Congress could ever have intended or contemplated that the extralateral right of the locator should be recognized or denied upon any such irrational, purposeless distinction as that would be. There is no top in this intervening section, we are told, because the vein there has not the appearance of a terminal edge. What is the downward course of the two thus uinted? The word "top," and the word "apex,"

are associated in the statute with the words "downward course" and the meaning of the word "top" or "apex" can only be arrived at by bearing that association in mind.

We have these two veins followed upward from the deep and in this intervening or middle 1500-foot section, where, at the top or summit, they have formed a union, there is no difficulty whatever in ascertaining what the downward course of each of the two is. How is the top of the vein to be ascertained or determined? By following upward in the reverse direction of its downward course until we come to the place where it terminates in its upward course, whether that be at or beneath the surface. There we have the top of the vein, have we not, whatever form or whatever shape that top may present to the eye?

We go a step further. We will suppose that of the intervening or middle 1500-foot section upon which Jones' location has been laid, throughout the westerly 750 feet thereof, the two veins are found at the surface with separate tops or apices; while throughout the easterly half of the 1500 feet the two have united or formed a junction giving the appearance of but one vein at the top or summit in the form of a crest. Jones would then have the right to follow both of these veins indefinitely to the deep on the westerly half of his location because they there had separate tops or apices, but under the same location, covering part of the same mineral deposit, part of the same two veins, he would, under appellant's contention, have no extralateral rights whatever on

either one of these veins in the easterly half of his location.

The contention goes too far. It leads to results which it is manifest could not have been within the contemplation of Congress.

We have extralateral rights upon the two, if they are found at the surface as separate and distinct veins dipping in opposite directions, but if, unfortunately for the locator, they form a juncture in their upward course so that at the top or summit the ores of the two are intermingled, it is asserted that we can have no extralateral right upon either one of them. Why? What beneficial purpose is subserved by any such irrational interpretation of the language of the statute as that would be? Who is injured if we are given the right to follow extralaterally each of these contra-dipping veins throughout its entire depth between the legal end line planes of our claim? No one else can lay a valid location upon either one of them, and it is possible that the owner of the claim which covers the top or summit of both of them shall not be permitted to follow either one of them or both of them? Would not the contention of plaintiff, if it received the sanction of the courts, have an inevitable tendency to check and retard the development of the mineral wealth of the state?

In the case of *Stevens* vs. *Williams*, 23 Fed. Cases (Case No. 13414), the court says:

> "• • • we have now to consider the question which was so much discussed by counsel, as

to the location with reference to the top and apex of the vein. And upon that point it is clear, from an examination of the act, that it was framed upon the hypothesis that all lodes and veins occupy a position more or less vertical in the earth, that is, that they stand upon their edge in the body of the mountain; and these words, 'top' and 'apex,' refer to the part which comes nearest to the surface. The words used are 'top' and 'apex,' as if the writer was somewhat doubtful as to which word would best describe or best convey the idea which he had in his mind. It was with reference to that part of the lode which comes nearest to the surface that this description was used; probably the words were not before known in mining industry,—at least, they are not met with elsewhere, so far as I am informed. Perhaps they were not the best that could have been used to describe the manner in which the lode should be taken and located. But, whether that be true or not, they are in the Act of Congress, and there seems to be little doubt as to their meaning; they are not at all ambiguous. In some instances they may, perhaps, refer to the *floe* of the lode; that is, a part of the lode which has been detached from the body of mineral in the crevice, and flowed down on the surface; in others, where there is no such outcrop, they may mean that part which stands in the solid rock, although below a considerable body of the superficial mass which I have attempted to describe to you. We are all agreed, however, (the courts and counsel, every one), that that is the meaning of the words; that they are to be taken in some such sense as that,—as being the part of the lode which comes nearest the surface; and the act requires that the location shall be along the line of this top or apex."

In *Duggan* vs. *Davey* (Dak.), 26 N. W. 887, (cited and justly commended at page 20 of plaintiff's brief), the court, at page 901, speaking of the definition of top or apex, as given by one of the geologists, says:

> "The definition given is no doubt correct under most circumstances, but, like many other definitions, is found to lack fullness and accuracy in special cases, and I do not think important questions of law are to be determined by a slavish adherence to this letter of an arbitrary definition. It is, indeed, difficult to see how any serious question could have arisen as to the practical meaning of the terms 'top' or 'apex,' but it seems in fact to have become somewhat clouded. I apprehend if any intelligent person were asked to point out the top or apex of a house, a spire, a tree or hill, he would have no difficulty in doing so, and I do not see why the same common sense should not be applied to a vein or lode. Statutory words are to receive their ordinary interpretation, except where shown to have a special meaning, and as I think the testimony shows that these terms were unknown to miners in their application to veins before the statute, the ordinary rules would seem to apply to them."

Why deny to the discoverer of a vein or lode which is in the form of a *single* anticlinal fold, who has laid a valid location thereon covering the entire width of its crest from end to end, who has spent his time, labor and money in the hope of developing something of worth, and after long exploration and much expense has succeeded in developing a valuable mine, all extralateral right because the summit of his vein was not found as a terminal edge? And in whose favor is he to be denied

such right? The southerly limb or side of his vein on its dip or downward course passes beyond the side line of his claim, we will say, within a few hundred feet from the crest. Shall the balance thereof in its downward course be awarded to the owner of the adjoining claim who was a stranger to the discovery of the vein, and who could not have based a valid location upon it? Would such a rule or doctrine as that have a tendency to encourage citizens to search for and develop the mineral wealth of the nation?

The time spent by the prospector in the search for precious metal mines does most often prove to be time lost; and the expenditure in mining operations of large sums of money in the hope or upon the faith of developing anything of value does, in the vast majority of cases, prove to be money thrown away. In number, the prizes won are insignificant as compared with the blanks drawn. If, then, he who has been fortunate enough to have discovered a lode or vein of real worth and has, by the expenditure of large sums, developed the wealth thereof, is not by the courts secured in the enjoyment of all the fruits of his enterprise so far as this may be done without trenching upon the spirit of the law, the inevitable result must be discouragement to the intelligent prospector and to the enterprising investor, thus retarding, instead of promoting, the development of the nation's mineral resources.

One who, by his labor and enterprise, brings into circulation the hidden treasures of the earth is entitled

to his reward. The wealth which he thus acquires injures no one, but on the contrary it promotes the prosperity of all.

In *2 Lindley,* Section 335, the author says:

> "The discoverer in all ages and all countries has been regarded as conferring rights or claims to reward. Gamboa, who represented the general thought of his age on this subject, was of the opinion that the discoverer of mines was even more worthy of reward than the inventor of a useful art. Hence, in the mining laws of all civilized countries the great consideration for granting mines to individuals is *discovery.* 'Reward so bestowed,' says Gamboa, 'besides being a proper return for the labor and anxiety of the discoverers, have the further effect of stimulating others to search for veins and mines on which the general prosperity of the state depends.'"

This passage is quoted with approval by this court in the case of *Lawson* vs. *United States Mining Company* (207 U. S. 1), and after quoting, the Court says:

> "The two thoughts here presented are reward for the time and labor spent in making the discovery, thus adding to the general wealth, and an incentive to others to prosecute searches for veins and mines. To take from the discoverer a portion of that which he has discovered, and give it to one who may have been led to make an adjoining location by a knowledge of the discovery, and without any previous searching for minerals, is manifest injustice."

Again in *3 Lindley,* Section 866 (at page 2170), the author in treating of the burden of proof resting upon

one who seeks to pursue his vein extralaterally beneath the surface of his neighbor's territory, says:

> "He is certainly entitled to the benefit of all presumptions of fact which logically flow, in common mining experience, from other facts which may be proved. *Nor are questions of doubtful construction of the mining laws to be resolved against him.*" (Italics ours.)

The law is to be applied to the facts found in a given case. And in arriving at a conclusion the court should look to the results that are liable to flow from its decision and put that interpretation upon the act, if it be susceptible of such, as will not defeat the main purpose and policy of Congress, which was to encourage the search for metals and the development of the wealth of the country. Nothing, we submit, but imperious necessity from which there was no escape, would justify the court in upholding the contention of appellant.

In plaintiff's brief no case is cited, and we say with entire confidence that none can be found, in which any court has heretofore been called upon to consider or determine what the top or apex of a vein having the form of a single anticlinal fold would be within the meaning of the law. No such question was presented in the case of *Duggan* vs. *Davey,* 4 Dakota 110, cited by our opponents. In that case two edges or outcrops of the vein were exposed, one along the western face of Custer Hill traversing it in a northerly and southerly direction, and the other traversing the northern slope of the hill in an easterly and westerly direction. The plaintiff con-

tended that the edge or outcrop exposed on the western slope was the top or apex of the vein; while defendant contended that the edge or outcrop exposed on the northern slope was the true top or apex of the vein. The court held with the plaintiff and determined that the outcrop shown on the northern slope of the hill was merely an exposure of the edges of the vein on the line of its dip—a side-edge.

Counsel for plaintiff, at pages 21 and 22 of their brief, cite and quote from the case of *Illinois Silver M. Co.* vs. *Raff*, in support of their contention.

But in that case the court was not called upon to consider what the top or apex of a vein in the form of a single anticlinal fold would be. That the facts or the conditions with which the court had to deal in that case bore no similarity to those involved in the case at bar, is apparent from the following excerpt taken from the opinion of Fall, Judge, speaking for the majority, 34 Pac. Rep., pp. 544, 545:

> "* * * The contention of plaintiffs is that, in taking ore from the ground of the Calamity, they followed a vein having its apex within the side lines of the Illinois, on its dip, under the east side line of the last mentioned claim, into the Calamity ground; that this vein consisted of different shoots, veins, gashes, pockets, or bodies of ore, occurring in lime, or in the contact between lime and shale, all connected by stringers or otherwise, forming a continuous contact vein with its apex on the Illinois,—a shale hanging wall and blue lime foot wall, and ore in the different pockets or places, when found, while of different values,

of practically the same characteristics. The defendants contend that, within the meaning of the law, there is no vein either upon the Illinois or Calamity; that the ore occurs in an immense lode or mineral-bearing lime zone; that the ore, whether deposited in the pockets, gashes, pipes, or other forms, by infiltration, sublimation, or otherwise, was so deposited without reference to the shale or hanging wall; that the entire body of lime, practically, is mineralized, or at least that deposits of mineral of the same character are found from the surface of the lime, whether overlaid by shale or exposed to the air, down to the lowest depths at which work has been done; that there is no apex upon the Illinois claim; that the so-called apex is a point upon the lime mineral lode or zone whence the shale has been eroded upon the throwing up, in a rolling form, of said lime zone; that said bare spot extends westward across the side line of the Illinois, and on to the adjoining property; * * * defendants, further contend that, if it is conceded that the Illinois and Calamity are located upon a vein of mineral, then the apex of that vein is to the north of both, and upon the Andy Johnson and Brush Heap mines."

And at pp. 545-546:

"It would be the height of foolishness for a court in New Mexico, with our mineral-bearing lime formation extending with the different mountain ranges from Colorado to Old Mexico, to say that mineral cannot be found in lime at a thousand feet depth or on the surface, with a cap of slate or a contact of porphyry. One of these lime belts, zones, or masses may be mineral-bearing throughout its length and breadth in one certain locality or in various places, and the body, mass, or zone bearing the mineral dip into the earth on all sides under mountains of granite, with no apex to the

vein or mass distinguishable to the naked eye, or discoverable by the ingenuity of the prospector. The zone or mass may follow the undulations of a broken country down into the valley, and rising over the divides, cutting through, covered by, or overlapping other formations; but until it is broken, and the edge exposed or some edge *or end* as a beginning point found, from which it can be followed down at some angle below the horizontal, there is no apex from which it can be followed beyond the side lines of a claim located upon it. * * *"

The vein involved in the case of *Stewart Mining Company* vs. *Ontario Mining Company*, 237 U. S., p. 350, cited by appellant, had a northerly and southerly course and terminated abruptly against a fault of great magnitude (the fault being several miles in width, as appears from a decision in the same case by the Supreme Court of Idaho, 132 Pac. 787-791). There was an edge of the vein exposed in its downward course along the side or plane of the fault. The plaintiff claimed that this edge was the top or apex of the vein, while the defendant insisted that it was not the top, but the *end-edge* or *side-edge* of the vein in its downward course. The trial court held with the defendant, the decision was affirmed by the Supreme Court of the State and by the Supreme Court of the United States. No other question was involved in the case.

The form or shape of the vein or lode with which the court was dealing in the case of *Stevens* vs. *Williams*, cited and quoted from in plaintiff's brief at pages 22 and 23, bore no resemblance to the vein or lode here involved.

The Leadville vein or lode was a contact vein having blue limestone for its foot wall and white porphyry for its hanging wall. This contact vein had a downward course generally at a low angle from the horizontal. Of course the top or apex of the vein would be ascertained and determined by following the vein upward in a direction the reverse of that of its downward course until it reached the surface or, if it did not outcrop, where it ceased and terminated in its upward course. It also appeared that that vein in its downward course was undulating, there being a series of anticlinal and synclinal rolls in it. No one, of course, would contend that the top of any one of these rolls was the top or apex of the vein. (Nor would any one contend that the top or summit of any one of the anticlinal rolls depicted in figure 9, found at page 26, of plaintiff's brief, was the top or apex of the vein.) The defendant in the *Stevens* case contended that the plaintiff's location was laid upon not the top or apex of the vein, but covered one of such rolls. These were the conditions, the facts, with which the learned Justice had to deal; these were the facts respecting which he desired to enlighten the jury, as to what was meant by the top or apex of a vein. And at pp. 574-5, Mr. Justice Miller says:

> "The next point is, that it is denied that there is a top or apex to this ledge or vein, and that if there is such a one it is not within the side lines of the plaintiff's patent. Perhaps upon that point the defendants have mainly rested their case. I think that you will agree with me, as all the counsell agree and all the witnesses agree substantially, conceding that there is a vein, that the top or the

apex of a vein, within the meaning of the Act of Congress, is the highest point of that vein where it approaches nearest to the surface of the earth, and where it is broken on its edge so as to appear to be the beginning or end of the vein. The word 'outcrop' has been used in connection with it, and in the true definition of the word outcrop, as it concerns a vein, is probably an essential part of the definition of its apex or top; but that does not mean the strict use of the word 'outcrop.' That would not, perhaps, imply the presentation of the mineral to the naked eye, on the surface of the earth, but it means that it comes so near to the surface of the earth that it is found easily by digging for it, or it is the point at which the vein is nearest to the surface of the earth; it means the nearest point at which it is found toward the surface of the earth. And where it ceases to continue in the direction of the surface, is the top or apex of that vein. It is said in this case that the point claimed to be the top or apex is not such, because at the points where plaintiff shows or attempts to prove an interruption of that vein, in its ascent toward the surface and what he calls the beginning of it, the defendants say, that is only a wave or roll in the general shoot of the metal, and that from that point it turns over and pursues its course downward, as a part of the same vein, in a westerly or southwesterly direction. It is proper, I should say to you, if the defendants' hypothesis be true, if that point which the plaintiff calls the *highest point, the apex,* is merely a swell in the mineral matter, and that it turns over and goes on down in a declination to the west, that it is not a true apex within the statute. *It does not mean merely the highest point in a continuous succession of rolls or waves in the elevation and depression of the mineral nearly horizontal."* (Italics ours.)

In *1st Lindley on Mines*, Section 300, at page 670, the author, after quoting from a report of Professor Emmons descriptive of this Leadville deposit, says:

> "A glance at the geological atlas accompanying this monograph shows that in many portions of this mineral belt these deposits lie in a position approaching the horizontal, sometimes forming a basin, at others alternating in anticlinal and synclinal folds. * * *"

Our understanding is that that vein or lode with its footwall of blue limestone and hanging wall of white porphyry continued in its general upward course until it was found outcropping at the surface or at the top of bed rock immediately beneath the debris of the hillside.

In the United States Geological Survey (J. W. Powell, Director, Second Annual Report, 1880-1881) is found a report on the geology and mining industry of Leadville, Colorado, by S. F. Emmons, in which, at page 209 (of this volume), he states that:

> "In 1875 * * * the claims which now belong to the Iron Silver Mining Company, covering, with remarkable accuracy * * * the *croppings* of the ore bearing stratum over a distance of more than a mile."

And at page 257 (speaking of the Iron Hill Mines), he says:

> "The average strike of the formation in this vicinity is a little west of north and the beds dip to the eastward at an angle of about 12 degrees at the outcrop, which shallows to 7 degrees and even less at the summit of the hill."

And at page 259 it is said:

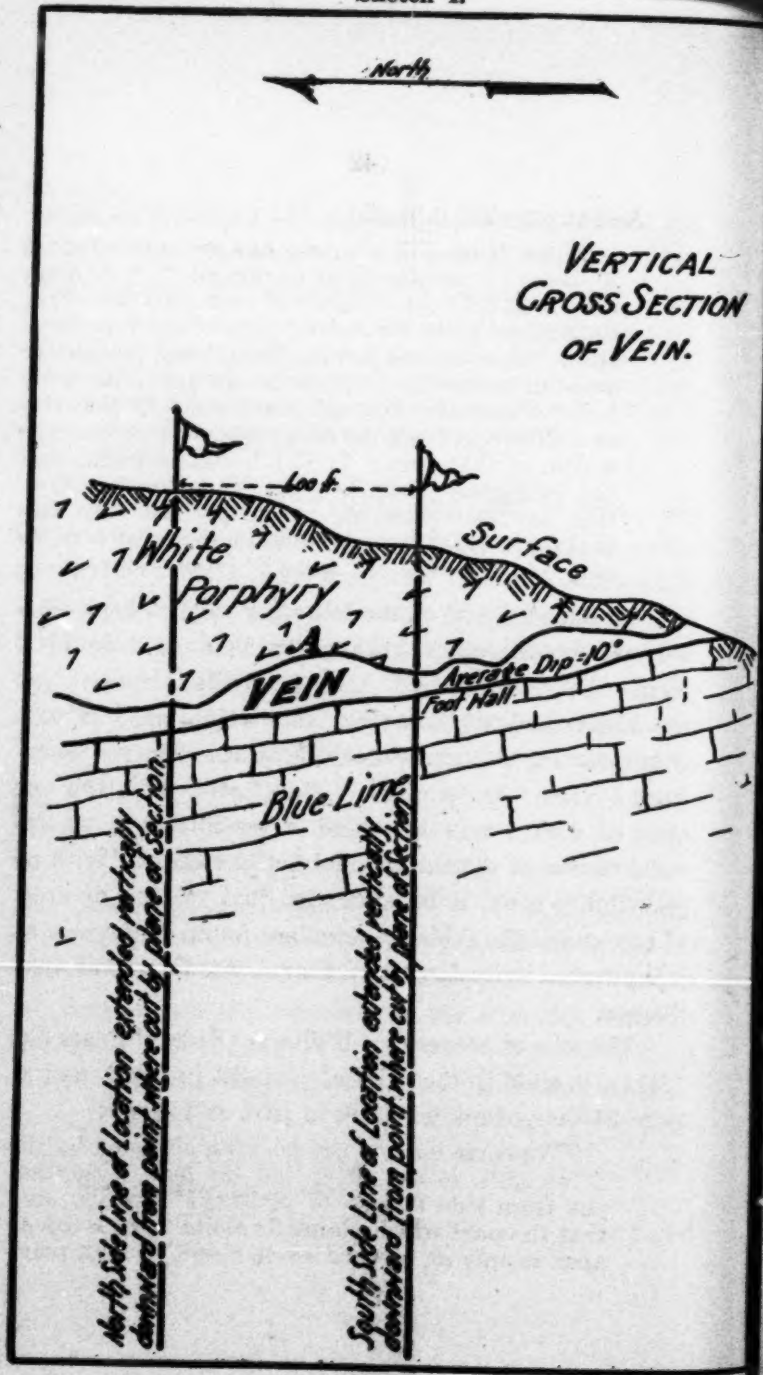
> "*Iron Mine.*—This group has an area of about 25 acres of underground workings. * * * They have been driven a distance of over 1500 feet along the contact from the *outcropping* of the blue limestone. Here the contact has been found productive over an unusually large area, the main ore body being diagonally through the claims in a northeast direction from the *croppings* with an average width of 200 feet. * * * It is found that the limestone, while keeping its general inclination to the eastward, is compressed into lateral folds which have produced a series of *troughs and ridges within the mass.*" (Italics ours.)

On Sketch No. 4, on the following page, is depicted a vertical cross-section through a vein or lode in a form characteristic of the Leadville deposit (as we understand it), showing the vein and its undulations in its general or average course downward from the surface. Manifestly the top or apex of such a vein is where it terminates in its upward course at the surface and not elsewhere. With no plausibility could it be contended that the top or crest of any one of the folds or anticlines found in the vein as it is pursued in its downward course, was the top or apex thereof.

The case of *Stevens* vs. *Williams* (Federal Cases No. 13414), is cited in the brief of plaintiff in error, and at page 24 thereof quoted from in part as follows:

> "We come next to the position assumed by the defendants, to the effect that the lode is continuous from side to side of plaintiffs' location, and that the part which plaintiffs claim to be a top or apex is only an upward swell, ridge, or high point

Sketch 4.


North
VERTICAL
GROSS SECTION
OF VEIN.
100 ft.
White
Porphyry
Surface
VEIN
Average Dip=10°
Foot Wall
Blue Lime
North Side Line of Location extended vertically downward from point where cut by plane of Section
South Side Line of Location extended vertically downward from point where cut by plane of Section

in the vein from which it descends in both directions.

"And if it is continuous, as suggested—that is to say, if coming in at one side it passes unbroken to the other—the plaintiff cannot follow it beyond the lines of his location. * * * And no location can be made on the middle part of a lode, or otherwise than at the top or apex, which will enable the locator to go beyond his line."

That case is another of the so-called Leadville cases and we freely subscribe to what is said by the court in the passage quoted.

Referring again to Sketch 4, it will be seen that the north and south side lines of a location laid upon the middle part of the vein are shown, extended downward vertically from the points where cut by the plane of section. The vein as there shown does, as it is followed in its downward course from its top or apex at the surface, enter the south side line of the location and then continuing rises upward to the point marked "A," whence it continues unbroken downward to and across the north side line. We do not, nor could we contend, nor could anyone, that the point marked "A" at the summit of this upward roll is the top or apex of such a vein.

How widely different from the Leadville lode or deposit, is the vein or are the veins found in the West End claim. *First,* they are fissure veins, all of the ore bodies lying in and along a fissure, the onward and downward course of all the ore bodies being conformable to the onward, as well as downward, course of the fissures. (See testimony of *Chandler,* Tr. Vol. 1, pp. 130,

131; *Wiley*, Vol. I, pp. 84-5; *Bradley*, Vol. I, pp. 192-3; *Hoxey*, Vol. I, pp. 28-9; and *Finch*, witness for plaintiff, on cross-examination, pp. 336-338.) *Second*, instead of having an undulating vein with a succession of rolls anticlinal and synclinal, as in the Leadville cases, the vein or the veins in the West End claim are free from any such irregularities or convolutions, the downward course of the north dipping side or limb and that of the south dipping limb being regular and substantially uniform throughout. This is shown by the evidence, with little or no conflict, and the court, in its fourth finding of fact, says:

> "* * * that the dip or downward course of both the northerly and southerly dipping sides or limbs of the vein where the two are found in conjunction, as aforesaid, and also in the places where each, as aforesaid, has its separate and independent top or apex, is regular and practically free from undulations; that the said southerly dipping limb or side of the vein in the easterly portion of the West End claim * * * has been developed from the top or summit * * * to and beyond the southerly side line of said claim, or for a distance, measured on the slope * * * of 800 feet or thereabouts, the average dip there being 17 degrees from the horizontal; that the westerly portion * * * of said southerly dipping limb * * * in the West End claim, has been developed from its top to and beyond the southerly side line of said claim, or for a distance, measured on its slope * * * of 1000 feet or thereabouts, the average dip there being 30 degrees from the horizontal; that the average dip of said northerly dipping limb or side of said vein, so far as the same has been developed in its downward

course, is 17 degrees from the horizontal; that said vein is a fissure vein." (Tr. Vol. II, p. 681.)

(The correctness of the finding as here quoted is not challenged by any assignment of error, and yet in the brief of plaintiff in error the vein is repeatedly referred to as a "flat vein" or a "blanket vein." Clearly it cannot be so characterized. There could be no extralateral right, of course, on a flat vein—a vein in a horizontal position—for such a vein would have no downward course.)

That the propositions thus far discussed received the thoughtful consideration of the Supreme Court of Nevada is shown by the elaborate and lucid treatment thereof in its opinion, Tr. Vol. II, pp. 693-702, to which opinion we invite especial attention.

But, if it were possible to conclude that within the meaning of the Act the word "top" or "apex" necessarily implies a "terminal edge," the case of plaintiff-in-error would thereby be aided not at all, for by the findings of fact made by the trial court—not only amply sustained by the evidence, but unchallenged—the upward termination of the vein, if there be but one, or of each of them, if there be two, is in truth found in the form, shape or likeness of a terminal edge.

Throughout the trial, the contention of the defendant was that instead of there being within the West End claim but one vein in the form of a single anticline, there were two fissure veins, the top or downward course of one being southerly, and the other northely; that the southerly dipping vein was the older of the two, that the later or northerly dipping vein in its upward course

intersected the southerly dipping vein and continued in its upward course beyond the plane of intersection to what then was the surface; that long after the creation of both these veins there was an outpouring of lava locally called "midway andesite" and frequently referred to by the witnesses as the "cap rock," which flowed over the old surface, burying the veins throughout to a considerable depth and in places to a depth of several hundred feet; that during the period intervening between the creation of the veins and the overflow of lava, the old surface had been largely and irregularly eroded (see testimony of *Winchell,* one of the witnesses for defendant, Tr. Vol. I, pp. 220-232); that during the long period elapsing since the midway andesite flow, it in turn has been greatly eroded; that each of these veins at its top crosses the easterly end line of the West End claim. That the northerly dipping vein on its course thence westerly and at its top crosses the northerly side line of the claim at a point about 1120 feet westerly from its northeast corner, measured along the north side line (*Winchell,* p. 230), while the southerly dipping vein on its course westerly crosses the northerly side line at a point 1142½ feet westerly of the northeast corner, measured along the north side line of the claim.

Professor Lawson, witness for plaintiff, agrees with defendant as to the sequence of geologic events after the formation of the vein or veins and testifies as follows:

> "That fissure and the mineralization of the fissure to form the West End MacNamara vein was

completed long before the appearance in this region of what is known as the Midway andesite. And the measure of that time between the formation of this vein and the appearance of the Midway andesite is in terms of erosion. * * * But it is also a well known principle in geology that we can also take some account of very large intervals of geological time by noting what has happened, not in the way of a deposition, but in the way of erosion; the extent and the amount of degradation of the earth's surface by the attack of rain and frost and the atmosphere generally, running water, all those things tend continually to reduce the inequalities of the earth's surface, to reduce them to the lower levels, carry away the waste, and so lower the surface. And if we note the extent of this erosion, then we form some idea, at least, of the interval of time which was necessary for that erosion to be completed to the extent that we can observe.

Now, that erosion so far as that in this region about Tonopah is concerned, has proceeded so far that fissures—the veins that existed in the region were exposed at the surface as outcrops, and when the Midway andesite was poured out over this surface as a lava flow, it buried the surface, and of course it buried also the outcrops of many valuable veins. * * *

After the accumulation of the Midway andesite, this region was subjected to a still further process of erosion. Another time interval was introduced, and during that time interval a large part of the Midway andesite was removed, and part of the old surface which was buried was resurrected by the removal of the cover, and that again was a long period of time." (Tr. Vol. II, pp. 564-5.)

The defendant, pending the litigation, to support its contention, caused a number of raises, so-called, to be

driven on the upward continuation of the northerly dipping vein above the plane of intersection of the two (or above what plaintiff claims to be the crest of a single anticlinal vein). These raises are shown upon defendant's model, Exhibit "A," and are thereon designated as raises 488, 466, A-1, A-2, A-4, A-5, A-6, A-7 and A. According to the testimony of defendant's witnesses, each of these raises followed the upward continuation of the northerly dipping vein to cap rock, or nearly so, and each disclosed throughout its length quartz and ore.

Mr. *Bradley,* witness for defendant, respecting these raises, testifies as follows:

> "488 raise is a raise driven in what I call the north vein quartz, following the hanging wall of the north vein for a distance of sixty feet. The hanging wall is easily traced through the entire course of the vein, and the quartz is of varying width, from three feet to about one and one-half feet in the face. * * * It is quartz in place as distinguished from drag ore. * * * Raise 461 is approximately 37 feet long, and it starts out of 461 drift, a hanging wall drift on the north vein, following the hanging wall on the north vein on the 496 to the intersection with the 411 east drift. The raise goes up from that level. It is in quartz all the way up, and the hanging wall is disclosed throughout the entire distance. There are values in that raise. The values are observable to the eye. 2-A raise is 120 feet in length. It starts from a stope and continues up over the hanging wall of what is called the south-dipping vein; all in continuous quartz for a distance of 85 feet. There is also good ore in this raise in places, one 45 feet up the raise, and the other 59 feet, carrying values observable to the eye. 4-A

raise is 63 feet in length. It is also driven in continuous quartz with no interruption and the hanging wall plainly visible throughout the raise. More than a foot of quartz in the face of the raise. The greatest thickness of quartz that I encountered in that raise is 4½ feet. 5-A raise also follows the hanging wall and the quartz in the north vein, driven for a distance of 137 feet, which shows continuous quartz for a width of from two to five and one-half feet, for a distance of 75 feet, where it is cut off by a porphyry wall. 6-A is also a raise on the north vein and has a height of approximately 23 feet. The same conditions obtain in this as in 5-A, 4-A and 2-A; quartz all the way up. 7-A is also a raise driven on a continuation of the north vein; it is very misleading,—the quartz varies. In some places it is hardly traceable at all; approximately fourteen feet from the end of the raise I saw no quartz at all. From there down to the bottom you have more or less quartz, although it is interrupted. It is hard to determine it; it is not as continuous, interrupted by slips and breaks and things that I don't know anything about. * * * But what there is has a north dip." * * *

Q. And in 366 raise, the one there in yellow on the model. State to the court what you find there, as to dip and material?

A. I find a north-dipping quartz following up to cap rock; it is cut off in its rise against the cap, and it is the same character as this quartz back here, being what is called the north-dipping vein.

Q. What are you pointing to?

A. Back here on the north-dipping vein.

Q. You are back to the stopes?

A. Yes.

Q. Now, did you observe this little piece of work that I now point to with my finger, colored in yellow and extended in red up to 466 raise?

A. Yes, I did.

Q. Is that run on the hanging wall, or is it simply a piece of work in the north-dipping vein?

A. Well, it is a continuation of a raise—302 raise, from a drift on the south vein, showing south-dipping quartz, and the raise shows the porphyry hanging wall for thirty feet, and is concealed by a scab of quartz, and is then exposed forty feet up the raise by a vertical raise exposing the porphyry hanging wall again. The porphyry hanging wall terminates against the north-dipping quartz, about eighty or eighty-two feet up the raise. The hanging wall of the north vein is exposed at the end of this 302 raise, and the quartz in the 366 raise is quartz in place, a large body in place. In the A raise we find a strong vein of quartz, not so much at the commencement of the raise, but obtaining an average width of three feet throughout the rest of the raise. It is two feet at the top. The north-dipping quartz follows the north-dipping hanging wall from the McNamara stope up through the A-raise. (Tr. Vol. I, pp. 181-184.)

To like effect, respecting these raises, is the testimony of *Chandler*, Tr. Vol. I, pp. 125-6, 127-9; *Jussen*, pp. 102-4; *Wiley*, pp. 38-42, and *Hoxey*, pp. 202-205.

(Raise 488, as shown on the model, is at or near the easterly end line of the West End claim, and raises 1-A, 2-A, 4-A, 5-A, 6-A and 7-A are found at intervals westerly therefrom, the last being about 350 feet westerly of said east end line, while the "A" raise is slightly beyond the point where the south dipping vein crosses the northerly side line of the claim 1142½ feet westerly from its northeast corner.)

Throughout the next 350 or 400 feet westerly from the 7-A raise, there has been little development work done. What is called the "Edward's fault" crosses through that region. But the situation there is depicted, as well as circumstances will permit, by competent experts. Mr. *Wiley*, pages 80-81, states that in his opinion, through that section it would be impossible to bring the top of the two limbs together; that owing to erosion the north and south dipping veins would not there come together, but that for that distance each would be found having a separate top or apex. See also, testimony of Mr. *Winchell*, Tr. Vol. I, pp. 220-227.

Mr. *Richardson* testifies that the red color on plaintiff's model, Exhibit "A," was intended to represent the south dipping vein, the yellow the north dipping vein, the very dark brown rhyolite, the purple trachyte; that the light green represents andesite-cap, and the dark green Brougher dacite-cap.

Now, an inspection of that model will show that for a distance of 350 feet, or more westerly, from the 7-A raise, the andesite-cap rock is found at so low an elevation as to make it impossible for the two veins to there unite in their upward course unless the dip of each was radically changed. A short distance westerly of this undeveloped area raises 302 and 366 are found, and here for a short distance in an easterly and westerly direction, to-wit, 40 feet, or such a matter, the two veins are again found intersecting or uniting, and there again, as we have seen, the north dipping vein is found to extend

upward above the top of the south dipping vein; and westerly therefrom the two are not again found intersecting or in conjunction in their upward course until we get to the said "A" raise just beyond the northerly side line of the claim.

Now, if we look to the specific findings of fact made by the trial court, it will be found that defendant's contention was by the Court in substance approved and its evidence in support thereof accepted by the Court as truly descriptive of the existing conditions as revealed by the workings.

(At page 29 of plaintiff's brief, the following quotation is made from the trial court's opinion, namely:

> "The all-important contention of fact is whether the body of quartz, ore, etc., or the bodies of quartz, ore, etc., in the controversy constitute one vein or two. The evidence easily preponderates that it, or they, form but one vein."

But the sentence immediately following this in the opinion is:

> "But, though thus found, to be one vein, this conclusion is not at all what might be called an absolute one, but is qualified, as will further appear in this discussion.")

In the fourth finding of fact, Tr. Vol. II, commencing at page 648, it is first stated that there is a vein which at its top or apex and on its course crosses the easterly end line of the West End claim and thence at its top or apex and on its course continues westerly in said claim between the side lines thereof to a point on

the northerly side line 1142½ feet from the northeast corner of said claim, measured along the northerly side line thereof, at which point said vein at its top or apex and on its course departs from said mining claim, crossing said northerly side line. That said vein dips southerly, and in its downward course so far departs from the perpendicular as to pass beyond the southerly side line of said West End mining claim, extended downward vertically, and thence into and beneath the surface of the said Eureka and Curtis lode mining claims of the plaintiff company.

And proceeding, the Court, at pages 649-651, says:

"The said vein is more particularly described as follows:

The said vein does not on its upward course, or at its top or apex, outcrop or reach the present surface, but is covered or buried to a considerable depth by lava, locally known as and called 'Midway' andesite, which, after the formation of the vein, flowed over the then surface of the territory in which the vein exists; that at and for a distance of 360 feet westerly from where said vein or lode crosses the easterly end line of said West End claim, which crossing is at a distance of 135 feet northerly from the southeast corner of said West End claim, there is a juncture or union between two limbs or sides of said vein, and from the summit of said juncture or union the downward course of one limb or side thereof is in a northerly direction, and the downward course of the other limb or side thereof is in a southerly direction; *that there is a continuation upward from the summit of said juncture or union of said northerly and southerly dipping limbs or sides of said vein, of ore and silver-bearing quartz or rock*

in place for a distance of from 20 or 30 to more than 100 feet, and to what was the surface before the same was buried beneath the said lava flow; that such ore and silver-bearing quartz were deposited where the same are now found and at the same time and during the same period that the main vein below was created, and from mineral-bearing solutions having the same source; that the dip is fairly conformable and strike or course of such upward continuation of ore and silver-bearing quartz is conformable to the dip and strike or course of said northerly-dipping limb or side of said vein from the summit of said juncture downward, and the Court finds that said upward continuation is a part of said vein or lode; that thence westerly, and for a distance of 360 feet, the northerly and southerly dipping limbs, sides, or slopes of said vein do not unite or form a union or juncture in their upward course, *but for that distance each of said limbs or sides has a separate and independent top or apex;* that thence westerly, for a distance of 40 feet, the northerly and southerly dipping limbs, sides, or slopes of said vein are again found in conjunction, as in the said most easterly 360 feet; *that thence westerly, and until said northerly and southerly dipping limbs, sides, or slopes of said vein intersect with and cross said northerly side line of said mining claim, they do not unite or form a union or juncture in their upward course, but for that distance each of said limbs or sides has a separate and independent top or apex;* that between said distance of 40 feet, where said northerly and southerly dipping limbs, sides, or slopes of said vein, as aforesaid, unite or form a union or juncture in their course upward, and said points on said northerly side line of said mining claim where, as aforesaid, said contra-dipping limbs, sides or slopes of said vein respectively intersect said side line and cross the same and so depart from said

mining claim, there are two points at which it appears that said contra-dipping limbs, sides or slopes of said vein on their upward course approach closely to a juncture or union, but as to said contra-dipping limbs, sides, or slopes of said vein at said two points actually forming a juncture or union on their upward course, the evidence is meager and unsatisfactory; that the point where the said northerly dipping limb or side of said vein departs from the said mining claim through the northerly side line thereof is 1120 feet westerly from the northeast corner of said claim measured along the northerly side line thereof; that the point where said southerly dipping limb or side of said vein departs from said mining claim through the northerly side line thereof is 1142½ feet westerly from the northeast corner of said claim measured along the northerly side line thereof; *that throughout said distance of 40 feet, where the contra-dipping limbs or sides of said vein are found in conjunction, as hereinbefore stated, there is a continuation upward from the summit of the juncture or union of said two limbs or sides of said vein of ore or vein quartz to what was the surface before the same was covered by the lava flow* * * *; that said vein is a fissure vein; that there is a difference in the strikes or courses of said northerly and southerly dipping limbs of said vein of about 40 degrees; that at said places and throughout said distances, where said contra-dipping limbs of said vein are found to intersect and form a juncture, as aforesaid, there has been a mingling of the mineralizations of said two limbs; that at such places and throughout said distances the footwall of said two limbs of said vein, within the angle beneath their said juncture, by the process of replacement has been converted into mineralized quartz for considerable distances below said junc-

ture, said replacement quartz extending from limb to limb.

That the shaft known as the McQuillan shaft was the discovery shaft of the West End mining claim; that said discovery shaft encountered and disclosed no vein or lode of mineral-bearing rock in place until, in its downward course, it cut and disclosed said northerly dipping limb or part of said vein; that said northerly dipping limb of said vein was cut and disclosed in said discovery shaft on the 3rd day of April, 1903." (Italics, of course, are ours.)

(These findings are substantially in accord with what is found in the court's opinion, pages 636 et seq.)

According to this finding it will be observed that for 742 feet of the 1142½ feet in length of the vein or veins covered by the West End claim, there is found today two veins, one dipping northerly and the other southerly, and each having an independent top or apex in the shape or form of a terminal edge, and that as to the balance of the said 1142½ feet—360 feet in one place and 40 in another —where—whether as a result of an intersection in the upward course of two separate and distinct veins, or as a union or juncture of the opposite dipping limbs of one and the same vein—the northerly dipping vein or northerly dipping limb continues upward from 20 or 30 feet to more than 100 feet to a terminal edge, above the plane of intersection or above what plaintiffs contend is the crest of a single anticlinal vein; that the ore and silver-bearing quartz found in this upward continuation were deposited at the same time that the main vein below was created and

from mineral-bearing solutions having the same source; that the dip and strike of such upward continuation of ore and silver-bearing quartz are conformable to the dip and strike of the northerly dipping vein or the northerly dipping limb or side, and was one and the same vein from the summit of said juncture downward, and that such *upward continuation is a part of said vein or lode.*

Let us suppose, if the Court please, that on April 3rd, 1903—when our discovery was made—the cap rock had been so far eroded as to expose the ore or quartz found at the top of some of these raises, we will say, the "4-A," "5-A" or "2-A"; and the prospector, having discovered one of these exposures, made a location based thereon, posting his notice at such discovery point, and laying his claim thereon, just as the West End was laid; that in prosecuting his work of development he followed down either one of these raises on continuous ore, quartz and vein material to its bottom and there encountered the larger ore bodies found in the north dipping vein, continuing thence downward in the same direction and at the same angle of dip as that of the ore and quartz which were found in the raise or raises. Could it be successfully contended that his location was invalid for lack of a discovery of a vein or rock in place bearing silver or other metals? Could it be successfully contended that such discovery was not on or at the top or apex of the veins? It would seem that any such contention would be swept aside as being without merit. And if there were found at the bottom of the raise the juncture of two veins dipping in opposite directions or if from thence down-

ward there was but one vein in the form of a single anticlinal fold, would not the locator have the right to follow both veins or both limbs or sides extralaterally throughout their entire depth between the legal end lines of his claim? (We here put aside the claim of appellant that one cannot have extralateral rights upon a vein or veins dipping in opposite directions, as we have heretofore answered that contention.)

III.

A further contention of plaintiff is: That the westerly end line or boundary line of the West End claim, being not a straight, but a broken line, the owner of that claim must be denied any extralateral right whatever upon any vein the top or apex of which is found within the surface lines thereof extended downward vertically, and this notwithstanding the fact that there is not found within the claim any vein or lode which crosses that line or which does not in its course westerly depart from the claim over the northerly side line thereof several hundred feet before this westerly boundary is reached.

(A true description of the West End claim is contained in the Answer [Tr. Vol. II, page 661], and is as follows:

"Beginning at Corner No. 1 (southeast corner)

* * *

"Thence, first course, south 74° 42′ west 750 feet to Corner No. 2; 1406.8 feet to Corner No. 3 (southwest corner).

"Thence, second course, north 11° 20′ west 301 feet to Corner No. 4;

"Thence, third course, north 5° 31′ east 313.3 feet to Corner No. 5 (northwest corner);

"Thence, fourth course, north 74° 6′ east 749.9 feet to Corner No. 6;

"Thence, fifth course, north 74° 42′ east 608 feet to Corner No. 7;

"Thence, sixth course, south 83° 58′ east 134.5 feet to Corner No. 8 (northeast corner);

"Thence, seventh course, south 5° 31′ west * * * 590.7 feet to Corner No. 1, the place of beginning."

It will be noted that the easterly end line and the northerly 313.3 feet of the westerly end or boundary of the claim are parallel, while the southerly 301 feet of the westerly end line or boundary though not parallel to, inclines in its course southerly toward the easterly end line of the claim.")

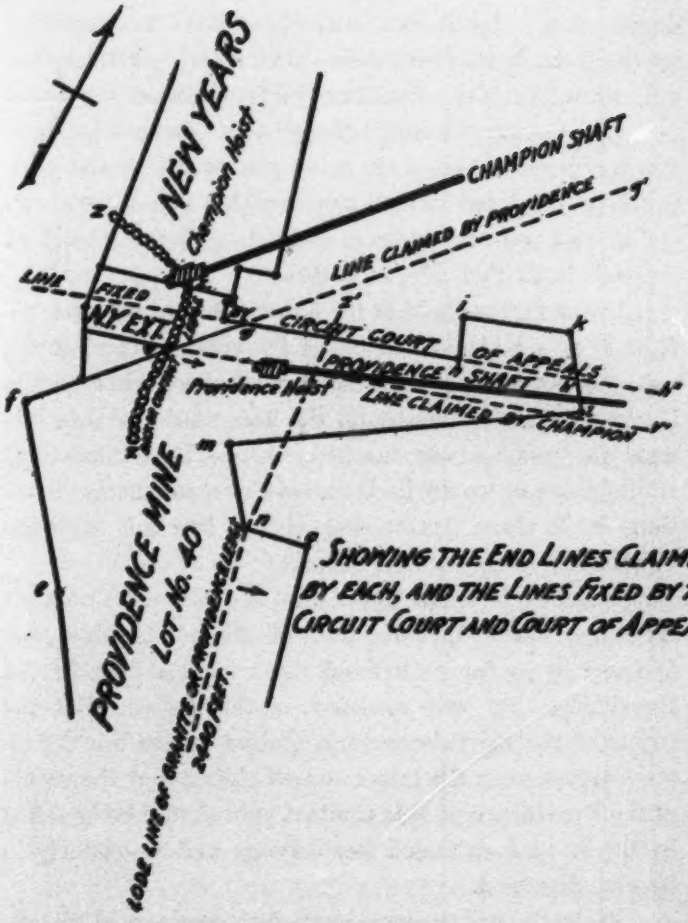
In support of this contention, plaintiff cites the case of *Walrath* vs. *Champion Mining Co.*, 171 U. S. 293, wherein this court, at pages 311-2, says:

> "It is the end lines alone, not they and some other lines, which define the extralateral right, and they must be straight lines—not broken or curved ones—they must be straight—no other defined planes which can be continuous in their own direction within the meaning of the statute."

That case, we believe, will be found upon examination to be opposed to the contention of plaintiff. In the diagram opposite we present a copy of the plat accompanying the decision of this court (found on following page).

The Providence lode, shown in part upon said diagram, was located prior to but patented under the law of 1866. The New Year's Extension lode, shown upon the diagram, was located in the year 1877 by the Champion Mining Company. As originally located the lines of the New Year's Extension extended in part over the surface

ground of the Providence claim. In 1884 a new location of the New Year's lode was effected, whereby all conflicting claims to the lodes and surface of the Providence were entirely relinquished by the Champion. The diagram shows the lines of the New Year's Extension as relocated. The apex of the discovery vein of the Providence called the Granite vein extended throughout the entire length of the claim, the vein dipped to the east, and is also shown upon the diagram. The Contact vein, as it was called, as far as the Providence claim was concerned, was a subsidiary or secondary vein, but was the primary or discovery vein of the New Year's Extension and crossed that location from north to south so that the northerly and southerly *located* side lines were its *legal* end lines. The litigation related to and involved only the rights of the respective parties on this Contact vein. The Providence claimed that the end line f-g, which is one of the northerly boundaries of that location, constituted an end line, so far as the Contact vein was concerned, and that its owners were entitled to pursue that vein extralaterally and at all points southerly of the line f-g extended in its own direction. The Champion, on the other hand, contended that the Providence was not entitled to pursue this Contact vein on its dip or otherwise northerly of the line v-v^1 for the reason that the Contact lode which, like the Granite lode, dipped to the east, departed from the Providence patent at the point v. The case was tried before Judge Hawley, sitting as circuit judge. He decided that



SHOWING THE END LINES CLAIMED BY EACH, AND THE LINES FIXED BY THE CIRCUIT COURT AND COURT OF APPEALS.

the end lines of the Providence were the southerly boundary a-p, and the line g-h, one of the northerly boundaries of the claim; that both these lines were crossed by the Granite lode and were substantially parallel—the only lines, therefore, fulfilling the functions of end lines.

(Now, since a mining claim cannot have more than two true legal end lines, the line f-g must have been by the courts in that case treated as one of the side lines of the claim, and it is so designated by the Circuit Court of Appeals in 72 Fed. 978, at p. 980.)

It was further held at the Circuit that as between the New Year's Extension and the Providence, the line f-g was the boundary; that the Providence rights on the Contact should be limited to the area south of that line until the point g was reached, thence its extralateral rights thereon would be bounded (in a northerly direction) by a plane drawn through the line g-h extended indefinitely in its own direction.

Walrath took an appeal to the Circuit Court of Appeals, where the decision of Judge Hawley was affirmed in so far as it fixed the true end lines of the Providence, but was modified in the respect that the rights of the Providence were limited by the line f-g on the Contact vein, the latter court holding that the rights of the Providence on this Contact vein should be bounded by the line g-h extended westerly, as well as easterly in its own direction.

Walrath, still being dissatisfied, prosecuted an appeal to this court, in which the decision of the Circuit Court of Appeals was affirmed.

(It will be observed that the northerly extremity of the Providence patent is the line i-k, or the northerly boundary of the quadrilateral h-i-k-h^1.) The result of Judge Hawley's decision was that Walrath was deprived of all ore north of the lines f-g and g-h, and the result of the decision of the Circuit Court of Appeals was that he was deprived of all ores in the Contact vein, including that part of the lode beneath the quadrilateral, north of the line g-h extended both easterly and westerly in its own direction.

(It may be suggested by the plaintiff-in-error that since the Providence claim was located prior to the Act of 1872, it might be in any form, no matter how irregular, and that parallelism of end lines was not required by the Act of 1866. This, however, cannot be said of the New Year's Extension lode which was located under the Act of 1872.)

By virtue of the relinquishment of the territory contained in the new location of the New Year's Extension lode, the line f-g became the boundary line both as to lode and surface, between the Providence patent and the New Year's Extension location. This line appears to be part of the southerly boundary of the New Year's Extension location. Was it the southerly end line or a part of the southerly end line, for the purpose of defining extralateral rights? If it had been so regarded by the courts, the New Year's Extension could not possibly have had any right whatever within the Providence patent, for the line f-g projected in its own direction would entirely exclude the New Year's Extension from

the Providence territory. Accordingly, the court must have held that the line f-g was not the southerly end line or any part of the southerly end line of the New Year's Extension. The southerly end line of the New Year's Extension, for extralateral purposes, must therefore have been held to be the line running from the point v westerly to the southwest corner of the New Year's Extension claim, crossed by the Contact vein, for on no other theory could the court, as against the Champion, have limited the right of the Providence to any part of any vein found within the boundaries of the Providence extended downward vertically. Regardless of any question of extralateral right, the owners of the Providence were, of course, entitled to and were the owners of all ores found beneath the surface of that claim save as aganist one who might establish that a portion of such ore (to-wit, that found beneath the quadrilateral h-i-k-h^1) belonged to a vein which had its apex in a claim owned by him and that his claim was so laid upon the apex thereof as to give to him extralateral rights which would include such ore. All the Providence had to do in order to make a prima facie case entitling it to all the ores within the surface boundaries of its patent would be to introduce the patent itself. For it has been repeatedly held that there is a presumption, only to be overcome by evidence, that the owner of a mining claim is the owner of everything found beneath the surface thereof.

That the owners of the New Year's Extension, notwithstanding its southerly boundary was a broken line,

had a right to pursue the Contact vein extralaterally, was clearly recognized not only by the Circuit Court and the Circuit Court of Appeals, but by this Honorable Court, for it was awarded by the decree of the Circuit Court, which in this respect was affirmed on both appeals, all of the ores northerly of the line g-h extended including that within the parallelogram h-i-k-h^1, the surface of which had been patented to the Providence. This is made clear by what is found in the statement of the case in this court, wherein at page 300, it is said:

> "As a result of this decree the complainant was not only shut out of all extralateral rights in the Contact vein north of the line g-h-h^1, but also of that portion of the vein lying vertically beneath the surface lines of the Providence which extend north of that line, and which are marked upon the figures as constituting the parallelogram h-i-k-h^1, which was awarded to the Champion."

And in the body of the opinion, at page 311, it is said:

> "The right to that portion of the Contact ledge within the boundaries of the parallelogram h-i-k-h^1 presents an interesting question. It does not appear to have been submitted to either of the lower courts, but the right by the decree of the circuit court is given to appellee by adjudging to it that portion of the vein on its dip which lies northeasterly of the line g-h and its continuation.
>
> "The question is a new one in this court, but we think it is determined by the principles hereinbefore laid down."

Also, in this statement, at page 300 (referring to the assignments of error), it is said:

> "* * * The last two assail so much of the decree as awards to appellee the right to pursue the vein on its downward course underneath the parallelogram h-i-k-h[1]."

Each of the courts, therefore, must have regarded so much of the line f-g as constitutes in part the southerly boundary of the New Year's Extension as a side line, and not an end line of that claim, notwithstanding it formed a part of the southerly boundary of the claim. Now, the southerly end line, or boundary line, rather, of the New Year's Extension is just exactly as much a broken line and no more so than is the westerly end line, or boundary line, of the West End claim.

It follows, under the authority of this Walrath case, that if the northerly dipping vein, the discovery vein, in the West End claim had crossed not only the east end line of the location, but the northerly segment of the west boundary line which parallels the east end line, and if the secondary or subsidiary vein within the claim had crossed the east end line and the southerly segment of the westerly boundary line and had dipped northerly instead of southerly, the owners of the West End claim would, by virtue of intralimital rights, have been entitled at least to the whole of the latter vein easterly of the southerly segment, to the point where the southerly and northerly segments of the west boundary join, and from thence northerly would be entitled to pursue the same extralaterally between vertical planes drawn one through the east-

erly end line and the other through the northerly and parallel segment of the westerly boundary, each extended indefinitely in its own direction. The easterly end line and the northerly segment of the westerly boundary being crossed by the discovery vein, would be the true legal end lines of the claim and would bound or limit the extralateral right upon any other vein the top or apex of which might be found within the surface boundaries of the claim; and the southerly segment of the westerly boundary would have to be regarded or treated as a part of the southerly side line just as the line f-g in the Walrath case was regarded and treated as a part of the side line not only of the Providence, but of the New Year's Extension.

It has been judicially declared that the intent of Congress was to secure to the locator of a vein or lode, who had complied with the provisions of the Act, the possession and enjoyment of a length upon the discovery and all other veins throughout their entire depth, the tops or apices of which are found within his boundaries, equal to the length along the top or apex thereof covered by his location, and the courts, as we will see, have manifested, especially in later years, a disposition to place a liberal interpretation upon the statute in order to give effect to this intent and to secure to the locator this right. For instance, notwithstanding it was apparent from the plain letter of the Act that Congress

contemplated that mining locations should be laid along the course of the vein embracing its top or apex, and that the extralateral right could be pursued only beyond the side lines—not the end lines or an end line—of the claim, yet it is well settled that if one, by inadvertence or mistake, so lays his claim that the vein on its course crosses the side lines thereof, these located side lines will be regarded as the *legal* end lines of his claim and he is given extralateral rights upon the vein throughout its entire depth beyond his *located* end line, but between planes drawn vertically downward through the *located* side lines of his claim.

Empire M. & M. Co. vs. *Toombstone M. & M. Co.*, 100 Fed. 910, 913-914; *Last Chance Mining Co.* vs. *Bunker Hill M. & C. Co.*, 131 Fed. 579, 586-8; *State-Idaho M. & D. Co.* vs. *Bunker Hill M. & S. Co.*, 131 Fed. 591, 603-4; *Empire M. & M. Co.* vs. *Toombstone M. & M. Co.*, 131 Fed. 339, 344; *Gleason* vs. *Martin-White Company*, 13 Nev. 459, 460. *Lindley on Mines*, Vol. 2, Secs. 367, 589.

Again: It was long a controverted question whether any extralateral right attached to a vein which at its top and on its course crossed an end line and side line of the claim,—those who denied the existence of such right contending that since the lines of the claim so crossed by the vein were the *legal* end lines, and since they were not parallel, the owner of the claim could not follow the vein beyond its vertical boundaries.

The question finally came before the courts for determination and it is now well settled that in such a case the owner is entitled to follow such vein extralaterally

between planes, one drawn through the end line so crossed, and the other parallel thereto through the point on the side line where the vein leaves the claim.

Of the many cases in which this right has been upheld, it will be sufficient to cite the following:

Del Monte M. & M. Co. vs. *N. Y. & L. C. M. Co.*, 66 Fed. 212;

Fitzgerald vs. *Clark* (Montana), 42 Pac. 273,

both of which cases were affirmed by this court, the former in 171 U. S., p. 55, and the latter in the same volume, p. 92.

Again: In the case of *Ajax Mining Company* vs. *Hilkey, et al.* (Colorado), 72 Pac. 447, it appeared that the discovery vein in the Victor Consolidated claim, (which was laid in a northerly and southerly direction), owned by plaintiff, crossed the southerly end line of the claim and departed over the easterly side line at a point 1000 feet distant from such end line (the claim being 1500 feet in length); there was a secondary vein, the apex of which was found within this claim, which crossed the westerly side line within a few feet of the northerly end line and traversing the claim diagonally, passed out of it over the easterly side line at a point 200 feet northerly of the southerly end line. This secondary vein dipped westerly and in its downward course passed beyond the westerly side line into and beneath the surface of the Triumph claim, owned by the defendants.

Plaintiff's action was brought to recover the value of ores taken by defendants from this vein where it was found on its dip beneath the surface of the Triumph.

The whole of the Triumph claim lay to the north, or northerly of the point where the discovery vein crossed the ~~westerly~~ easterly side line of the claim, as before stated.

It was contended on the part of defendants that since the extralateral right, on the discovery vein, was limited by its planes, one drawn through the end line crossed by it and another parallel thereto through the point where it departed from the claim over the side line thereof, that plaintiff could assert no extralateral right upon the secondary vein northerly of the latter plane, because, as defendants contended, the *legal* end line planes which bound the extralateral rights of the discovery vein must bound or limit the extralateral rights on all secondary veins.

The court overruled this contention, deciding that the plaintiff was entitled to extralateral rights on this secondary vein between planes parallel to the located end lines, one through the point where this vein crossed the westerly side line, and the other through the point where it departed from the claim, over the easterly side line.

The case last above cited is quoted from with approval by the Circuit Court of Appeals of the Eighth Circuit in the case of *Work Mining & Milling Company* vs. *Doctor Jack Pot Mining Company*, 194 Fed. 620, (at page 629).

The extent to which the Circuit Court of Appeals of the Ninth Circuit has gone in an effort to safeguard and uphold the extralateral right of the locator finds

illustration in the following cases, among others that might be cited:

Bunker Hill & S. M. & C. Co. vs. *Empire State-Idaho M. & D. Company*, 109 Fed. 538;

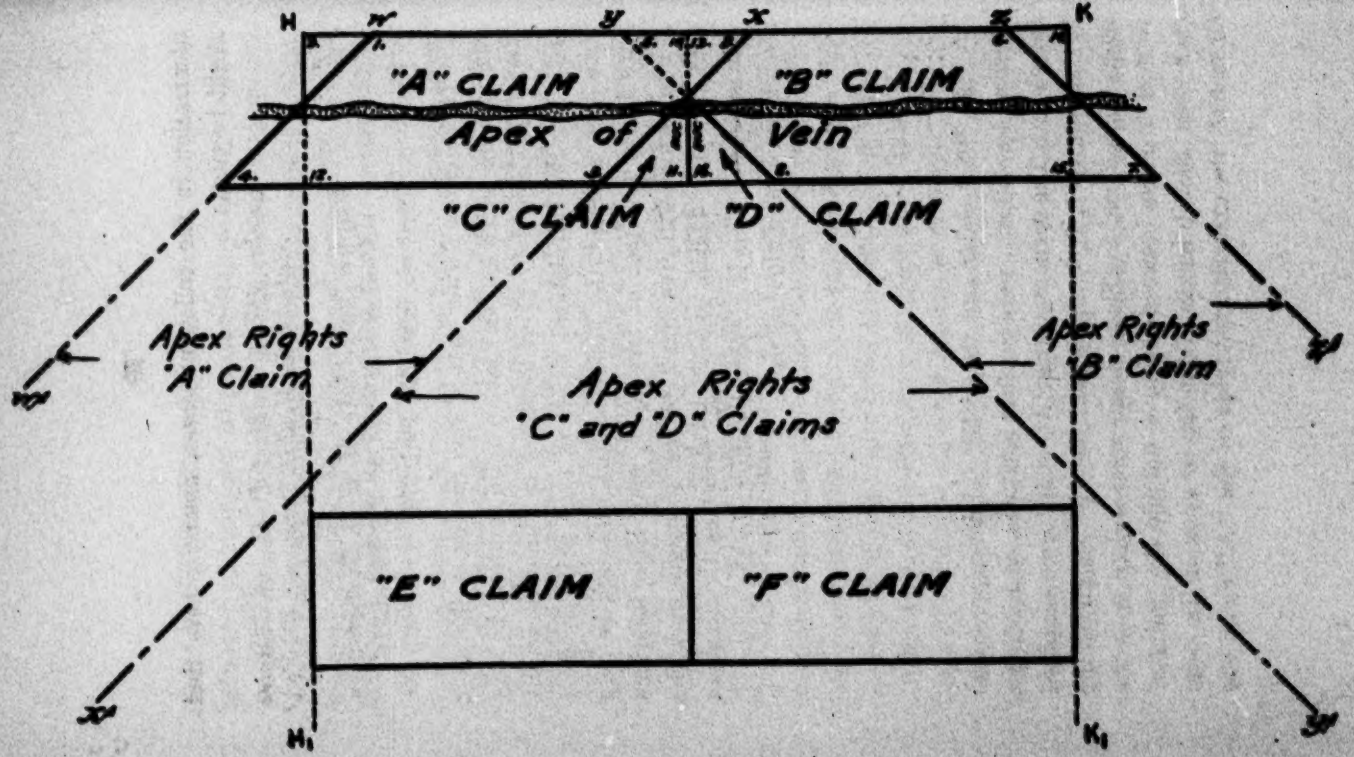
Empire State-Idaho M. & D. Company vs. *Bunker Hill etc. Co.*, 131 Fed. 591;

Same vs. *Same*, 121 Fed. 973.

These cases decide that if one discovers the apex of a vein on which he can make a valid location, he may throw his claim over prior locations in either direction, and after the extralateral rights of such prior locators have been satisfied, the junior locator, although he may have but a few feet of free apex, may base locations thereon which will give him 3,000 feet in length upon the vein at depth. ~~This is graphically shown by the diagram vein at depth.~~ This is graphically shown by the diagram, Sketch No. 5, on following page.

The "A" claim and the "B" claim represented thereon, we will say, were the first locations, each being a full claim. The corners of the "A" claim are designated by the figures 1, 2, 3, and 4, and the "B" claim by the figures 5, 6, 7 and 8. These claims were so laid upon the vein as to leave between the two—outside the limits of each—ten feet in length of the top or apex of the vein. Of course, the extralateral rights of the "A" claim are

Sketch 5.


H
K
"A" CLAIM
"B" CLAIM
Apex of Vein
"C" CLAIM
"D" CLAIM
Apex Rights "A" Claim
Apex Rights "C" and "D" Claims
Apex Rights "B" Claim
"E" CLAIM
"F" CLAIM
H1
K1

bounded by the dotted lines on the diagram W—W-1 and X—X-1, while the extralateral rights of the "B" claim are bounded by the planes Y—Y-1 and Z—Z-1. Subsequent to these locations Brown locates the "E" claim and the "F" claim as shown by the diagram, both of which have gone to patent. Thereafter, Smith, having ascertained that there was this ten feet of free apex between the "A" claim and the "B" claim, makes two locations thereon, namely, the "C" claim (the corners of which are designated on the diagram, or Sketch 5, by the figures 9, 10, 11 and 12), embracing five of the ten feet of free apex, and the balance, or 1495 feet in length of the claim, is thrown westerly, overlapping the "A" claim, while the "D" claim, (the corners of which are designated by the figures 13, 14, 15 and 16), includes the remaining five feet of such free apex, the balance of the claim, namely, 1495 feet in length being thrown easterly overlapping the "B" claim. Now, under the decisions above cited, Smith has extralateral rights on the vein throughout its entire depth between the lines or planes H—H-1 and K—K-1, except those portions thereof which fall within the extralateral right limits of the "A" claim and the "B" claim respectively, thus giving him at depth 3,000 feet in length upon the vein which includes all of the ore bodies, however extensive or valuable they might be, found in the vein in its downward course beneath the surface of the "E" claim and the "F" claim.

The doctrine announced in these cases is upheld upon the ground that while it is true that there was but ten feet of free apex open to location, yet Smith had the

right to throw his claims over the senior locations as aforesaid, and though he did not own the apex in the overlapping areas, yet he had the right to follow the vein on its dip or downward course as aforesaid, and claim all of the ore beneath the surface of the "E" claim and the "F" claim, because the vein did not have its top or apex in either of these claims, and did not belong to the locators thereof, even as against Smith, who owned no more than ten feet of its apex.

In *Consolidated Wyoming Gold Mining Co.* vs. *Champion Mining Co.*, 63 Fed. Rep. 540, at pp. 548-9, the court says:

> "• • • The statute should be so construed as to give to the locator what he actually locates; no more and no less. It should be liberally construed in his favor, so as to give him the full benefit of the statute in its true spirit and intent, in order to carry out the wise and beneficent policy of the general government in opening up the mineral lands for exploration and development. When the prospector discovers a vein of ore of sufficient value to justify the expenditure of time, labor, and money to open up and develop the same, he is honestly and legally entitled to the fruits of his labor. He is admonished by the law that he will be limited in the length of his lode upon its strike to such portion as is within the surface lines of his location, but he is at the same time assured that he will not be limited or deprived of his extralateral rights as to the depth of such lode, upon its dip, the apex of which is within the surface lines of his location. The statute of 1872 gives to locators of mining claims 'the exclusive right of possession and enjoyment of all the surface included within the lines of their locations, and of

all veins, lodes, and ledges, throughout their entire depth, the top or apex of which lies inside of such surface lines extended downward vertically, although such veins, lodes, or ledges may so far depart from a perpendicular in their course downward as to extend outside the vertical side lines of such surface locations.' These are their extralateral rights, which should neither be extended nor restricted by the courts. The only limit placed by the statute is that 'their right of possession to such outside parts of such veins or ledges shall be confined to such portions thereof as lie between vertical planes drawn downward, as above described, through the end lines of their locations, so continued in their own direction that such planes will intersect such exterior parts of such veins or ledges.' One general principle should pervade and control the various conditions found to exist in different locations, and its guiding star should be to preserve in all cases the essential right given by the statute to follow the lode upon its dip, as well as upon the strike, to so much thereof as its apex is found within the surface lines of his location."

(The court was dealing with a case where the vein in question crossed a located end line and side line.)

In *Tyler Mining Co.* vs. *Last Chance Mining Co.*, 71 Fed. 848 (which was also a case where the vein crossed the end line and departed from the claim over one of its side lines), the court, at p. 851, says:

"What the defendants now ask is, in effect, the application of the common-law rule. To do this, we must find some warrant for it in the statute, or at least nothing against it. If there is any right emphatically granted by the mining laws, it is one in direct contravention of the common law. Sec-

tion 2322, Rev. Statutes, grants to the locator of a ledge (1) the right to follow it throughout its entire depth; (2) contrary to the common-law rule, to so follow it 'outside the vertical side lines of the surface location'; and (3) when he so locates his claim that his ledge passes through his two end lines, there is no doubt that he can follow it on its dip indefinitely, and along its course for a distance equal to that between the two end lines. In other words, the right granted is to follow it downward wherever it may go, regardless of the vertical planes of his side lines, and for a length along its course equal to the length of apex within his surface limits restricted only by the vertical, extended planes of his end lines. What reason, under the law, can be assigned why these rights shall not apply when his location is such that his ledge passes through it in some other way than from end to end? The law does not say that his ledge must run from end to end, but he is granted this right of following 'all veins, lodes and ledges throughout their entire depth, the top or apex of which lies inside of his surface lines.' Upon the fact that an apex is within his surface lines, all his underground rights are based. When, then, he owns an apex, whether it extends through the entire or through but a part of his location, it should follow that he owns an equal length of the ledge to its utmost depth. These are the important rights granted by the law. Take them away, and we take all from the law that is of value to the miner. Courts will not fritter them away by ingrafting into the law antagonistic common-law principles, or other judicial legislation. Is there any difficulty in applying these rights to a location wherein the ledge passes through an end and a side line? What are the planes that must then bound the underground rights? It will be conceded that the plane of the end line through which

the ledge passes shall be one. The statute says the right to follow the ledge along its course underground shall be limited by the planes passed through the two end lines, but it is manifest that this rule cannot be followed when the apex of the ledge, before reaching the other end line, passes out of a side line, for it would give the locator more of the ledge underground than he has of apex. It would give him a portion of the ledge of which he does not hold the apex, and to hold that his ledge shall be cut off by the vertical plane of his side line is cutting off the right to follow it down which the law has given him. Instead thereof, to establish at the point where the apex crosses the side line a vertical plane parallel to the plane of the end line cut by the apex, and allow him to follow the ledge on its dip between these two planes, is not in violation of any provision of the statute, and gives the miner no greater rights than the statute intends he should have."

This court, in the *Del Monte* case, 171 U. S., p. 91, refers to and quotes with approval from the case last above cited, as follows:

"* * * In *Tyler Mining Co.* vs. *Last Chance Mining Co.*, * * * Beatty, District Judge, in the course of his opinion pertinently observed: 'What reason under the law can be assigned why these rights shall not apply when his location is such that his ledge passes through it in some other way than from end to end? The law does not say that his ledge must run from end to end, but he is granted this right of following 'all veins, lodes, and ledges throughout their entire depth, the top or apex of which lies inside of his surface lines.' Upon the fact that an apex is within his surface lines, all his underground rights are based. When, then, he owns an apex, whether it extends through

> the entire or through but a part of its location, it should follow that he owns an equal length of the ledge to its utmost depth. These are the important rights granted by the law. Take them away, and we take all from the law that is of value to the miner."

Doubtless the intent and purpose of the Act of 1872 requiring parallelism of end lines of a mining location, was to prohibit or preclude the locator from claiming or holding any greater length upon the vein at depth than the length of the apex of the vein found within his surface lines.

In *Second Lindley,* Section 574, at page 1271, the author says:

> "We think it can be plausibly asserted that the object and intent of the Act of 1872, in so far as it required parallelism of end lines as a condition precedent to the exercise of the extralateral right, and as applied to locations made subsequent to its passage, was to prevent the locator in following his vein downward from acquiring a greater length underneath the surface than he had at the surface."

But let us suppose that within a valid mining claim there is found a vein or lode which on its course and at its top or apex crosses both of the located end lines of the claim; that these are straight lines, but instead of being parallel they are converging in the direction of the dip or downward course of the vein. If the courts were to lose sight of the spirit and intent of the Act and adhere strictly to the letter thereof, they would have to say to the owner of the claim:

> "The statute under which you claim extralateral

rights requires in plain terms that 'the end lines of each claim shall be parallel to each other.' Confessedly the end lines of your claim are not parallel and notwithstanding they are found to be converging in the direction of the downward course of your vein, you cannot be awarded any extralateral right thereon without doing violence to the plain letter of the statute."

The courts, however, having regard to the plain intent of the law, have upheld the extralateral right of the locator under such conditions, bounding the same, however, by vertical planes drawn through these converging end lines, each extended in its own direction until they intersect.

In *Second Lindley on Mines*, Section 574 (p. 1272), it is said:

"Neither a location nor a patent with converging end lines falls within the reason of the rule. There can be little doubt that extralateral rights may be enjoyed under locations made or patents issued under either act where the end lines converge in the direction of the dip of the vein, giving the locator or patentee less in length on the vein beneath the surface outside of his vertical boundaries than he has at the surface."

And in Section 582, the author after commenting upon a number of cases in which the question of extralateral rights is dealt with, says (p. 1300):

"Where, however, the two lines crossing the lode converge in the direction of the dip, intersecting, as they are produced, at some point beyond the side lines, we cannot see upon what principle the doctrine can be maintained. Where the reason of the rule ceases, the rule itself should cease. To

say to a claimant with converging end lines, 'the law permits you to take as much of the vein in its downward course, beyond the side lines, as you may include within parallel surface side lines. You have taken less than you might have acquired; therefore, you shall have nothing,' is illogical."

And in *Carson City Gold & Silver Mining Company* vs. *North Star Mining Company*, 73 Fed. 597, Beatty, Judge, delivering the opinion, says, at p. 602:

"* * * That the end lines are not parallel cannot be the basis of an objection, because their convergence when extended in the direction of the dip of the vein, would give defendant less, instead of more, than the law provides for."

And the Circuit Court of Appeals, in the same case, 83 Fed. 658, says (at p. 669):

"The plaintiff in error contends that, if the patented area of the North Star is to be considered as a location, its end lines are not parallel, as found by the court, and that under Section 2320, Rev. St., the defendant in error possesses no extralateral rights under it. The Act of 1866, under the provisions of which the patent in this case was applied for, and under which the rights of defendant in error accrued, did not require parallelism of end lines. * * * Moreover, the end lines, as marked on the diagram, converge in the direction of the dip; giving the patentees less of the vein or lode, in depth, than they had at the surface. The object of the Act of 1872 in requiring parallelism of end lines was intended to give to the claimant of the lode as much of the lode or vein in its downward course as he had at the surface, but no more."

In the case of *Bunker Hill and S. M. & C. Co.* vs. *Empire State-Idaho M. & D. Co.*, 109 Fed. 538, it was conceded by the able counsel who represented the plaintiff in error that the owners of the Emma claim had the right to follow the vein in its downward course between vertical planes drawn through its converging end lines to the point of their intersection. (The Emma claim was located long after the passage of the Act of 1872.)

If the southerly dipping vein in the West End claim had crossed the easterly end line and the southerly half of the located west end line, the right to follow it extralaterally between converging end line planes would have been unassailable; on the other hand, had the discovery vein crossed the easterly end line and the northerly half of the west located end line and dipped northerly, and a secondary vein were found in the claim which crossed the easterly end line and the southerly segment of the west located end line, and also dipped northerly, the owner of the claim as to the latter vein would have intralimital rights thereon until the southerly segment of the broken west end line met the northerly segment and thence onward he would have extralateral rights upon the secondary vein between planes, one through the easterly end line, and the other through the northerly segment of the located west end line. This in accordance with the decision of all three courts in the case of *Walrath* vs. *Champion Mining Company.*

Again, what are the functions of end lines? In *Second Lindley*, Section 365, the author says:

"The function of end lines may be said to be

twofold:—(1) They stop the pursuit of the vein on its strike; (2) When properly constructed with reference to the located lode, permitting the exercise of extralateral right, they may be produced indefinitely in their own direction, so that vertical planes drawn downward through them, as so produced, carve out a segment of the vein throughout its entire depth, the ownership of which becomes vested in the locator, provided that the end line planes as extended do not conflict with the extralateral right planes of a prior locator."

Now, the westerly located boundary or end line of the West End claim does not perform either of these functions, nor would it do so if it had been a straight line parallel throughout to the east end line of the claim. It does not stop the pursuit of any vein in the claim on its course, for there is no vein the top or apex of which is found within the West End claim which reaches it. According to the undisputed testimony and the court's findings, the northerly dipping vein (which we claim was the discovery vein) departs from the claim over the northerly side line thereof 1120 feet westerly from the northeast corner of the claim, while the southerly dipping vein (which we claim was a secondary vein) crosses the same side line 1142½ feet westerly from the northeast corner of the claim. Under all the decisions heretofore rendered respondent's extralateral rights upon the northerly dipping vein are bounded by planes, one through the easterly end line which it crosses, and the other parallel thereto through the 1120-foot point; while the extralateral right upon the southerly dipping vein is bounded by planes, one through the east end line, and the other

parallel thereto through the 1142½-foot point. These would be the bounding planes of these respective veins even though the west located end line had been throughout parallel to the east end line. If the west located end line had been a straight line parallel to the east end line, a plane drawn through such west end line would not fix, define or limit the right of the owners of the West End claim as to either the northerly dipping or southerly dipping vein intralimitally or extralaterally. The westerly bounding plane of each of the veins is found several hundred feet east of the westerly boundary of the claim, and there is no vein, it will be borne in mind, the top or apex of which exists in the West End claim which does not on its course westerly terminate hundreds of feet before the westerly boundary or end line is reached. This line does not stop (nor if it were a straight line parallel throughout to the east end line would it stop) the pursuit on its course of any vein in the claim. Neither would a plane drawn vertically downward through such line limit or define the extralateral right upon any vein the top or apex of which is found within the claim.

Under such conditions, to hold that the owner of this claim has no extralateral right upon any vein the top or apex of which is found within his surface boundaries, because the located westerly end line, so-called, is not parallel throughout to the easterly end line, would be to sacrifice the spirit of the law to the dry letter thereof. Why should the spirit of the law be thus ignored? The West End Company, or its predecessors, at great expense, discovered this vein and developed the same. The

appellant was a stranger to its discovery and to its development. The location of the Eureka and Curtis claims of appellant, if made honestly and in good faith, must have been based upon the discovery of a vein, the top or apex of which was found within these claims, respectively. Neither of the locations of these claims could have been based upon the vein here in controversy, for confessedly no part of its top or apex is within either of them. If the Eureka and Curtis claims were located solely upon the hope or expectation of thereby securing all of the vein in controversy which should be found to extend beneath the surface of these claims, the locators thereof would occupy a position which was condemned by this Court in the case of *Lawson* vs. *United States M. Co.*, 207 U. S. 1.

Certainly there is no equitable consideration which would incline the court to deny respondent, who discovered and developed the vein, all extralateral rights thereon in favor of plaintiff, a stranger to the discovery. We submit that nothing save inexorable necessity arising out of the language of the act could induce any court to travel to a conclusion upholding plaintiff's contention. In *Second Lindley*, Section 592, at p. 1365, the author quotes from the decision of this Court in the *Del Monte* case, as follows:

> "The law places a limit on the length of the vein beyond which he may not go, but it does not say that he shall not go outside the vertical side lines unless the vein in its course reaches the end lines. Nowhere is it said that he must have a vein which

> either on or below the surface extends from end line to end line in order to pursue that vein on its dip outside the vertical side lines. Naming limits beyond which a grant does not go is not equivalent to saying that nothing is granted which does not extend to those limits. The locator is given a right to pursue any vein whose apex is within his surface limits, on its dip outside the vertical side lines, but may not in such pursuit go beyond the vertical end lines. And this is all the statute provides. Suppose a vein enters at an end line but terminates half way across the length of the location, his right to follow that vein on its dip beyond the vertical side lines is as plainly given by the statute as though in its course it had extended to the farther end line. It is a vein the top or apex of which lies inside of such surface lines extended downward vertically."

And on the following page the author makes this statement:

> "The excerpt quoted above from the decision of the Supreme Court of the United States in the *Del Monte* case is a clear enunciation of a wholesome principle which prevents the 'frittering away by construction' of the most valuable right granted by the mining laws, and prescribes a rational rule, the application of which will result in a commonsense solution of many of the problems encountered in the administration of those laws."

We commend this statement to the court's favorable consideration. It is an apt and pertinent commentary upon plaintiff's contention here by which it seeks to have this court "fritter away by construction" the rights and the property of respondent.

In the interpretation of a statute the effort of the court always is to discover the intention of its author—the object or purpose which the legislature intended to secure by its enactment.

When the intention of the lawmaker is manifest, or when by interpretation its intention is clearly ascertained, the courts will so construe the lagnuage of the act as to give effect, if possisble, to this manifest or ascertained intent. To this end the language employed in the act may be expanded beyond or restricted within its natural import. The rigor of the letter of the law will be made to yield to its spirit whenever this is necessary to effectuate the intent of the lawgiver. Any construction which would lead to an unjust, unreasonable or absurd result must, if possible, be rejected, for the presumption is to be indulged that the legislature did not contemplate or intend any such consequence.

In *Ex parte Ellis,* 11 Cal. 222, the following statement is found in the syllabus:

> "It is the duty of the courts to execute all laws according to their true intent and meaning; that intent, when collected from the whole and every part of the statute taken together, *must prevail, even over the literal sense of the terms, and control the strict letter of the law,* when the letter would lead to possible injustice, contradiction and absurdity."

And at pages 224-225, in the body of the opinion:

> "'When a particular construction of a statute, applied to a case which it seems by its terms to include, there follows from such a construction an absurd consequence; respect for the legislature will induce the court from thence to conclude that

some other construction, which will not produce such a consequence, ought to be adopted. Hence, every construction which leads to an absurdity ought to be rejected. (Smith's Com. 663.)

"'It is said that this rule should be followed, even in cases where there is neither obscurity nor anything equivocal in the law itself, for the reason that the absurdity of the literal sense of the law does not proceed merely from the obscurity of any other fault in the expression, but from the narrow limits of the human mind, which cannot foresee all cases and circumstances, or include all the consequences of what is ordained; that it is impossible for the legislature to enter into immensity of detail. It can only make laws in a general manner, and in applying their acts to particular cases, the construction ought to be conformable to the intention of the legislature. It cannot be presumed that the legislature intended anything absurd. When, therefore, the words, when taken in their obvious and proper sense, lead to it, it is necessary to turn them from that sense just as far as is sufficient to avoid an absurdity, if from the whole perview of the law, and giving effect to all the words used in it, it may fairly be done.'" (Citing Smith's Com. 664, *U. S.* vs. *Fisher*, 2 Cranch 400.)

In *Castner et al.* vs. *Walrod*, 83 Ill. 171, it is said, at page 179:

"'It has been decided that a thing within the letter was not within the statute, unless within its intention. The letter is sometimes restrained, sometimes enlarged, and sometimes the construction is contrary to the letter. (4 Bac. title Statute, 1, Secs. 38, 45, 50.) Every statute should be construed with reference to its object, and the will of the law-maker is best promoted by such a

construction as secures that object, and excludes every other.'"

In *Bell* vs. *City of New York*, (N. Y. Appeals, same case) 11 N. E. 495, it is said at page 497 (Peckham, Judge, delivering the opinion):

"* * * The exact and literal wording of an act may sometimes be rejected, if upon a survey of the whole act, and the purpose to be accomplished or the wrong to be remedied, it is plain that such exact or literal rendering of the words would not carry out the legislative intent."

In *Jones* vs. *Guaranty and Indemnity Co.*, 101 U. S. 622, the court, at page 626, says:

"* * * A thing may be within a statute but not within its letter, or within the letter and yet not within the statute. The intent of the lawmaker is the law."

In *Oates* vs. *National Bank*, 100 U. S. 239, the court at page 244, says:

"* * * The duty of the court, being satisfied of the intention of the legislature, clearly expressed in a constitutional enactment, is to give effect to that intention, and not to defeat it by adhering too rigidly to the mere letter of the statute, or to technical rules of construction. * * * And we should discard any construction that would lead to absurd consequences. *United States* vs. *Kirby*, 7 Wall. 482. We ought, rather, adopting the language of Lord Hale, to be 'curious and subtle to invent reasons and means' to carry out the clear intent of the law-making power when thus expressed. * * * 'A thing which is within the intention of the makers of a statute is as much within the statute as if it were within the letter; and a thing which is within the letter of the statute

is not within the statute unless it be within the meaning of the makers.' "

In *United States* vs. *Jackson*, 143 Fed. 783, the court says, at p. 786:

"• • • Courts should search out and follow the true intent of Congress, and adopt 'the sense of the words which harmonizes best with the context, and promotes in the fullest manner the apparent policy and object of the legislation.' "

See also, *Church of Holy Trinity* vs. *United States*, 103 U. S. 457;

People vs. *Utica Insurance Co.*, 15 Johnson's Reports, p. 355, pp. 380-381;

People ex rel vs. *Commissioner's Taxes*, 95 N. Y. 554, 558-559;

State of Nevada vs. *Toll Road Co.*, 10 Nev. 155, 160;

Ex parte Siebenhauer, 14 Nev. 365, 368-9;

State vs. *Ross*, 20 Nev. 61, 63;

State vs. *Clark*, 29 N. J. Law 96, 99.

There is no equitable principle—nothing in the cause of justice—to move this Court to so penalize (as plaintiff would have the court do) one who has discovered a vein or lode, located the same, and by his enterprise developed the wealth thereof. The plaintiff is here beseeching the court to ignore the spirit and obvious intent of the statute, to yield an unreflecting slavish adherence to the dry letter thereof in order to take from defendant, perhaps, the major part of that which he discovered, and deliver it over to the plaintiff. Why should the former be so punished—the latter so rewarded? As said by Mr.

Justice Brewer in delivering the opinion in the *Lawson* case, *supra:*

> "To take from the discoverer a portion of that which he has discovered and give it to one who may have been led to make an adjoining location by a knowledge of the discovery and without any previous search for minerals, is manifest injustice."

To avoid inflicting such wrong, we apprehend the court will find in the statute, construed according to its spirit, no difficulty in recognizing and upholding defendant's extralateral right upon the vein throughout its entire depth between planes, one drawn through the east end line of the claim, the other parallel thereto through the point where the vein crosses the northerly side line thereof (both extended in their own direction), as the courts have done in all other cases where it was made to appear that the vein or lode crossed an end line and a side line of the location.

There are a few suggestions in the brief of plaintiff in error not yet adverted to, which we will comment upon very briefly.

On page 37 it is said that if the statute may be so construed as to permit the exercise of extralateral rights in opposite directions beyond the side lines of a location, either on one and the same or on different veins, it would be equally permissible to allow an extralateral right beyond a vertical plane drawn through a side line and also one drawn through an end line of a claim. Not so, for by the terms of the Act, the extralateral right is to be bounded by vertical planes drawn through the end lines

of the claim so extended in their own direction as to intersect the exterior part of the vein or lode. The owner of a mining claim is not permitted, either by the letter or spirit of the Act, to pursue a vein the top or apex of which is found within the surface lines of his location beyond a true legal end line of his claim, either longitudinally or on its dip or downward course.

On page 40 of their brief counsel say:

> "Why should not the West End claim be permitted to exercise extralateral rights both to the north and to the south based on its anticlinal apex theory, and also in a third direction to the east, based on what is unquestionably a terminal edge of the vein crossing both side lines?"

Well, there are two answers to this query. *First*, as we have just pointed out, the West End Company could not be permitted to follow the vein extralaterally beyond a vertical plane through the east end line of its claim. *Second*, in the trial court, one of plaintiff's contentions was that the terminal edge referred to was the true top or apex of the vein, that it crossed the located side lines of the West End claim, and that if defendant were entitled to follow the vein, at all, extralaterally, it could only be so followed between vertical planes drawn downward through such *located side lines*, which were the *legal end lines*, extended easterly indefinitely in their own direction. But that court held that this contention was without merit. (See opinion, Tr. Vol. II, p. 634.) And it was waived or abandoned by plaintiff on its appeal to the Supreme Court of the State.

Also, on page 40 of their brief, counsel say:

> "Assume that we have a dome-shaped occurrence of a vein existing within the boundaries of a mining claim with the vein dipping in every direction from the apex or crest of the dome. Why not award the claimant an extralateral right in four directions?"

Again we reply that one who had laid a claim upon such a deposit would, as in case of all other mining locations, be precluded by the plain letter and intent of the Act from pursuing his vein extralaterally beyond either of the end lines of his claim. Once it was determined which were the end lines and which the side lines of his location, he could pursue it extralaterally only beyond vertical planes drawn through his side lines and between planes passed through his end lines. (The fact that the top or crest of a vein in the form of a dome or cone would not be in the likeness of a terminal edge, would be immaterial in the determination of the locator's extralateral rights. Let it be supposed that by erosion a vein in such form, if any such should ever be encountered, has been cut off, truncated near its top; as one followed around its perimeter, he would have a terminal edge exposed every foot of the way, and the difficulty, if any, in determining which were the end lines and which the side lines of a claim laid upon such a deposit and therefore what would be the bounding planes of the extralateral right would be the same, no greater nor less than it would be if the top of the deposit were not found in the likeness of a terminal edge. But we have here

no such vein or deposit to deal with. "Sufficient unto the day is the evil thereof.")

Again, at pages 41-2, counsel say:

> "We refer to Figures 3, 4 and 5, inserted in this brief, and respectfully urge that to grant appellee's contention and permit it to exercise double-barreled extralateral rights on the single flat, blanket-like vein occurrence there indicated and sweep the Tonopah mining district in both directions, is to place an unreasonable interpretation on Section 2322, and would lead to unjust and unnecessary hardships."

Unjust and unnecessary hardship to whom? Surely not to plaintiff in error, for no part of the top or apex of the vein is found in either the Eureka or Curtis claims owned by it, and the location of neither of these claims was or could have been based upon a discovery of the vein or veins found in the West End claim. And if there be in fact two veins, one dipping northerly and the other southerly, or if there be but one and the same vein in the form of a single anticline, with its opposite dipping limbs, to permit the owner of the claim who discovered and developed the vein or veins the right to follow the same extralaterally beyond the northerly and southerly side lines, between the bounding planes fixed by the court, would be in accordance not only with the plain letter, but with the spirit and intent of the Act. The statute permits a location to cover 1500 feet in length upon any vein or lode. In our case, owing to the fact that the top or apex of the vein or veins was buried beneath the lava flow and not discoverable from the surface, our claim was so

laid as to cover not 1500 but 1142½ feet only of the top of the vein on its course and our extralateral right, therefore, of course, is limited to the 1142.5 feet in length throughout the depth of the vein or veins. To award such extralateral right would not enable us, in the language of opposing counsel, "to sweep the Tonopah mining district." Moreover, this is the first time that it has ever been suggested or intimated that the extralateral right provided for in the statute was to be made dependent upon the size, any more than upon the richness of the vein discovered and validly located.

(The right of the locator to follow his vein in its downward course extralaterally is granted him, no matter how shallow or low the angle of declination may be. *Stevens* vs. *Williams*, 23 Fed. Cases, p. 44, at p. 46. *Same* vs. *Same*, 23 Fed. Cases, p. 40, at p. 42.)

Again, at pages 25-6 of the brief, it is suggested that peradventure, future developments may disclose that as the vein is followed in its downward course other undulations, synclinal and anticlinal folds, may be encountered therein. And it is said that "the courts are not going to perform the impossible and look into the undeveloped ground to prophesy whether there are other undulations or not beyond." The suggestion being that, since it is possible that other undulations may be encountered, the court should conjecture that such is the fact, and, acting upon such conjecture, based upon a mere possibility, deny to defendant who discovered, located and developed this vein, any extralateral right thereon, not-

withstanding the vein as developed for a distance of 1000 feet or more in its downward course is free from undulations.

Referring to Figure 11, found on page 45 of plaintiff's brief, we submit that if the vein there depicted is the only one the top or apex of which is found within the claim, the locator might well be awarded extralateral rights thereon between planes one drawn through the crossed end line and the other parallel thereto through the point where the vein departs from the claim over a side line thereof. This would give to him such length only upon the vein in depth as he had length of apex thereof covered by his location; the opposite end line of the claim shown in that figure does not limit or bound the locator's rights upon this vein either intralimitally or extralaterally; but however this may be, if the downward course of the vein was in the opposite direction to that indicated on Figure 11, clearly the locator would have extralateral rights thereon in the direction of the converging end line boundaries of the claim.

We respectfully submit that the Supreme Court of Nevada has correctly interpreted and applied the statute to the established facts in this case and that its judgment should be affirmed.

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JIM BUTLER TONOPAH MINING COMPANY *v.* WEST END CONSOLIDATED MINING COMPANY.

ERROR TO THE SUPREME COURT OF THE STATE OF NEVADA.

No. 249. Argued March 26, 27, 1918.—Decided June 10, 1918.

The end lines of a lode mining claim, in the sense of the mining law, are those which are laid across the vein to show how much of it in length is appropriated and claimed by the miner. All other lines are side lines.

To sustain the extralateral right, the end lines must be parallel and straight, but this is not required of the side lines.

A mining claim was laid out as a parallelogram 1500 by 600 feet, but with two diagonally opposite angles truncated so that what would have been end lines in the absence of the truncation were thereby shortened substantially, but less than one half. *Held*, that these shortened lines, which were straight and parallel, were the end lines within the meaning of the mining law and for the purpose of determining the extralateral right, and that the truncating lines were parts of the side lines.

The extralateral right is a creation of the federal mining laws and they alone must be looked to in defining it.

Where a single vein, whose apex is within the boundaries of the claim, in its descent separates into two limbs—one being the discovery vein

—which dip downward through the vertical planes of the side lines, the extralateral right, its other elements being present, applies to each.

The findings showed a fissure vein with two dipping limbs whose course downward was substantial, regular and practically free from undulation. For 750 feet out of a total length of 1150 feet within the claim each was practically a separate vein with a distinct summit or terminal edge. For the remaining 400 feet the two were united and from the place of union mineralised rock continued upward for from 20 or 30 to 100 feet. There was no contention that a top or apex had been found elsewhere. *Held*, that it could not be said as a matter of law that there was no top or apex within the claim, in the sense of the mining law.

39 Nevada, 375, affirmed.

THE case is stated in the opinion.

Mr. Curtis H. Lindley, with whom *Mr. Hugh H. Brown*, *Mr. Wm. E. Colby* and *Mr. J. H. Evans* were on the brief, for plaintiff in error:

One of the essential elements of an apex is a "terminal edge"; and, when the vein turns over and dips in the opposite direction, the resulting anticlinal roll has no legal apex, as is held by all the authorities that have considered the question. *Iron Silver Mining Co.* v. *Murphy*, 3 Fed. Rep. 368, 371, 375; *Stevens* v. *Williams*, Fed. Cas. No. 13,413, pp. 40, 43; *Stewart Min. Co.* v. *Ontario Min. Co.*, 237 U. S. 350, 360; *Alameda Min. Co.* v. *Success Min. Co.*, 29 Idaho, 618, 630; *Eureka Cons. Min. Co.* v. *Richmond Min. Co.*, 4 Sawyer, 302, 311; *Duggan* v. *Davey*, 4 Dakota, 110; *Illinois Silver M. Co.* v. *Raff*, 7 N. Mex. 336; Costigan, Mining Law, 139; Barringer and Adams, Law of Mines and Mining, 442; Shamel, Mining, Mineral and Geolog. Law, 193, 194; Mines and Minerals, 27 Cyc. 537; Raymond, Glossary of Min. and Met. Terms., Trans. Am. Inst., M. E., Vol. IX, 102.

Section 2322 of the Revised Statutes does not justify the exercise of an extralateral right on the same vein on two downward courses and in opposite directions, since

the wording of the statute will not permit such a construction. This is especially true where the limb of the vein on which the discovery was made dips in the opposite direction from the limb in which the disputed ore bodies occur.

The westerly end line of the West End claim is a broken line, which is in contravention of the mandatory provision of the statute requiring end lines to be parallel and necessarily straight.

Mr. W. H. Dickson, with whom *Mr. S. S. Downer*, *Mr. A. C. Ellis, Jr.*, and *Mr. H. H. Atkinson* were on the brief, for defendant in error.

Mr. Justice Van Devanter delivered the opinion of the court.

This is a suit by the owner of two lode mining claims—the Eureka and the Curtis—to enjoin the owner of an adjoining lode claim—the West End—from exercising an asserted extralateral right in respect of a vein extending beneath the surface from the latter claim into the others. All the claims are patented and their ownership is conceded. The Eureka adjoins the West End on the south and the Curtis lies immediately south of the Eureka. The state courts, both trial and appellate, upheld the defendant's asserted right to follow the vein extralaterally, 39 Nevada, 375, and the plaintiff seeks a reversal of that decision on the theory that it is in contravention of the mining laws of Congress, in that (a) the end lines of the West End claim are not parallel and straight, and therefore an essential element of the right to follow the vein extralaterally is wanting, (b) this right can be exercised only in one direction, that is, beyond one side line, not both, and as the discovery vein [1] dips to the north the

[1] The discovery was on the northerly limb hereinafter described.

right can be exercised only in that direction, and (c) the facts specially found do not show that the top or apex of the vein is within the vertical limits of the West End claim.

For present purposes the West End claim may be described as having the form of a parallelogram 1500 feet in length from east to west and 600 feet in width from north to south, but with a small portion of the northeast corner cut off by a diagonal line and a somewhat larger portion of the southwest corner similarly cut off (see diagram, 39 Nevada, 389). Thus what would be the end lines of the parallelogram, if it were complete, are substantially shortened, but the major part of each remains. These shortened lines are not only parallel but straight. Are they the end lines of the claim in the sense of the statute? Or do its end lines consist of the shortened lines and the diagonal lines? End lines in the sense of the statute are those which are laid across the vein to show how much of it, in point of length, is appropriated and claimed by the miner. All other lines are side lines. True, the end lines must be both parallel and straight, Rev. Stats., §§ 2320, 2322; *Walrath* v. *Champion Mining Co.*, 171 U. S. 293, 311, but it is not so with the side lines. They may have angles and elbows and be converging or diverging so long as their general course is along the vein and the statutory restriction on the width of claims is respected. *Del Monte Mining Co.* v. *Last Chance Mining Co.*, 171 U. S. 55, 84. Applying these tests to the bounding lines of the West End claim, we regard it as plain that the diagonal lines at the two corners are part of its side lines, and not of its end lines. In this respect the case is like *Walrath* v. *Champion Mining Co.*, *supra*, where in determining what was the northerly end line of the Providence claim (see diagram, 171 U. S. 298), the line g-h was held to be the true end line and the diagonal line f-g to be no part of it. Thus the objection that

the end lines of the West End claim are not parallel and straight is untenable.

What in mining cases is termed the extralateral right is a creation of the mining laws of Congress, and to learn what it is we must look to them rather than to some system of law to which it is a stranger. Besides, as Congress has plenary power over the disposal of the mineral-bearing public lands, it rests with it to say to what extent, if at all, the right to pursue veins on their downward course into the earth shall pass to and be reserved for those to whom it grants possessory or other titles in such lands. What it has said is this, Rev. Stats., § 2322:

"The locators of all mining locations . . . on any mineral vein, lode, or ledge, situated on the public domain, their heirs and assigns, . . . shall have the exclusive right of possession and enjoyment of all the surface included within the lines of their locations, and of all veins, lodes, and ledges throughout their entire depth, the top or apex of which lies inside of such surface-lines extended downward vertically, although such veins, lodes, or ledges may so far depart from a perpendicular in their course downward as to extend outside the vertical side-lines of such surface locations. But their right of possession to such outside parts of such veins or ledges shall be confined to such portions thereof as lie between vertical planes drawn downward as above described, through the end-lines of their locations, so continued in their own direction that such planes will intersect such exterior parts of such veins or ledges."

It will be seen that the extralateral right so created is subject to three limitations. One conditions it on the presence of the top or apex inside the boundaries of the claim. Another restricts it to the dip or course downward, and so excludes the strike or onward course along the top or apex. And the last confines it to such outside parts as lie between the end lines continued outwardly in their own

direction and extended vertically downward. But otherwise it is without limitation or exception and broadly includes "all veins, lodes, and ledges throughout their entire depth,"—one as much as another, and all whether they depart through one side line or the other. Given two veins which in their descent pass, one through one side line and the other through the other side line, how could it be held that the right applies to one vein and not to the other, when the statute says "all veins . . . throughout their entire depth"? By what rule would a court be guided in making a selection between the two when the statute makes none? And where a single vein in its descent separates into two limbs which depart through the opposite side lines, on what theory could the right be sustained as to one limb and rejected as to the other? The terms of the statute, as we think, do not lend themselves to any such distinctions, but, on the contrary, show that none such is intended.

In *Mining Co.* v. *Tarbet*, 98 U. S. 463, 467, this court in pointing out the intent of the statute said that "the end lines are to cross the lode and extend perpendicularly downwards, and to be continued in their own direction either way horizontally." And in *Del Monte Mining Co.* v. *Last Chance Mining Co.*, 171 U. S. 55, a case in which the statute was much considered, it was said, p. 88: "Every vein whose apex is within the vertical limits of his surface lines passes to him by virtue of his location. He is not limited to only those veins which extend from one end line to another, or from one side line to another, or from one line of any kind to another, but he is entitled to every vein whose top or apex lies within his surface lines. Not only is he entitled to all veins whose apexes are within such limits, but he is entitled to them throughout their entire depth, 'although such veins, lodes or ledges may so far depart from a perpendicular in their course downward as to extend outside the vertical side

lines of such surface locations.' In other words, given a vein whose apex is within his surface limits he can pursue that vein as far as he pleases in its downward course outside the vertical side lines." And again, p. 89: "The locator is given a right to pursue any vein, whose apex is within his surface limits, on its dip outside the vertical side lines, but may not in such pursuit go beyond the vertical end lines." In *Calhoun Gold Mining Co.* v. *Ajax Gold Mining Co.*, 182 U. S. 499, it was added, p. 508: "There are no exceptions to its language. The locators 'of any mineral veins, lode or ledge' are given not only 'an exclusive right of possession and enjoyment' of all the surface included within the lines of their locations, but '*of all veins, lodes and ledges throughout their entire depth*, the top or apex of which lies inside of such surface lines extended downward vertically.' A locator therefore is not confined to the vein upon which he based his location and upon which the discovery was made." And also, p. 509: "Blind veins are not excepted, and we cannot except them. They are included in the description 'all veins' and belong to the surface location."

We conclude therefore that, when the other elements of the extralateral right are present, it may be exercised beyond either or both side lines depending on the direction which the departing vein or veins take in their downward course.

So much of the special finding as bears on the character of the vein and the presence of its top or apex inside the vertical lines of the West End claim is as follows:

"The said vein does not on its upward course, or at its top or apex, outcrop or reach the present surface, but is covered or buried to a considerable depth by lava, locally known as and called 'Midway' andesite, which, after the formation of the vein, flowed over the then surface of the territory in which the vein exists; that at and for a distance of 360 feet westerly from where said vein

or lode crosses the easterly end line of said West End claim, which crossing is at a distance of 135 feet northerly from the southeast corner of said West End claim, there is a juncture or union between two limbs or sides of said vein, and from the summit of said juncture or union the downward course of one limb or side thereof is in a northerly direction, and the downward course of the other limb or side thereof is in a southerly direction; that there is a continuation upward from the summit of said juncture or union of said northerly and southerly dipping limbs or sides of said vein of ore and silver-bearing quartz or rock in place for a distance from 20 or 30 to more than 100 feet, and to what was the surface before the same was buried beneath the said lava flow; that such ore and silver-bearing quartz were deposited where the same are now found at the same time and during the same period that the main vein below was created, and from mineral-bearing solutions having the same source; that the dip is fairly conformable, and the strike or course of such upward continuation of ore and silver-bearing quartz is conformable to the dip and strike or course of said northerly dipping limb or side of said vein from the summit of said juncture downward, and the Court finds that said upward continuation is a part of said vein or lode; that thence westerly, and for a distance of 360 feet, the northerly and southerly dipping limbs, sides, or slopes of said vein do not unite or form a union or juncture in their upward course, but for that distance each of said limbs or sides has a separate and independent top or apex; that thence westerly, for a distance of 40 feet, the northerly and southerly dipping limbs, sides or slopes of said vein are again found in conjunction, as in the said most easterly 360 feet; that thence westerly, and until said northerly and southerly dipping limbs, sides, or slopes of said vein intersect with and cross said northerly side line of said mining claim, they do not unite or form a union or junc-

ture in their upward course, but for that distance [1] each of said limbs or sides has a separate and independent top or apex; that between said distance of 40 feet, where said northerly and southerly dipping limbs, sides, or slopes of said vein, as aforesaid, unite or form a union or juncture in their course upward, and said points on said northerly side line of said mining claim where, as aforesaid, said contra-dipping limbs, sides, or slopes of said vein respectively intersect said side line and cross the same and so depart from said mining claim, there are two points at which it appears that said contra-dipping limbs, sides or slopes of said vein on their upward course approach closely to a juncture or union but as to said contra-dipping limbs, sides or slopes of said vein at said two points actually forming a juncture or union on their upward course, the evidence is meager and unsatisfactory; that the point where the said northerly dipping limb or side of said vein departs from the said mining claim through the northerly side line thereof is 1120 feet westerly from the northeast corner of said claim, measured along the northerly side line thereof; that the point where said southerly dipping limb or side of said vein departs from said mining claim through the northerly side line thereof is 1142¼ feet westerly from the northeast corner of said claim, measured along the northerly side line thereof; that throughout said distance of 40 feet, where the contra-dipping limbs on sides of said vein are found in conjunction, as hereinbefore stated, there is a continuation upward from the summit of the juncture or union of said two limbs or sides of said vein of ore or vein quartz to what was the surface before the same was covered by the lava flow; that the dip or downward course of both the northerly and southerly dipping sides or limbs of the vein where the two are found in conjunction, as aforesaid, and also in the places where each, as aforesaid,

[1] Approaching 400 feet.

has its separate and independent top or apex, is regular and practically free from undulations; that the said southerly dipping limb or side of the vein in the easterly portion of the West End claim, that is to say, the easterly 360 feet thereof, has been developed from the top or summit of said juncture of said contra-dipping limbs to and beyond the southerly side line of said claim, or for a distance, measured on the slope or downward course of said southerly dipping limb or side, of 800 feet or thereabouts, the average dip there being 17 degrees from the horizontal; that the westerly portion, that is to say, the westerly 300 feet of said southerly dipping limb or side of said vein found in the West End claim, has been developed from its top to and beyond the southerly side line of said claim, or for a distance, measured on its slope or downward course, of 1000 feet or thereabouts, the average dip there being 30 degrees from the horizontal; that the average dip of said northerly dipping limb or side of said vein, so far as the same has been developed in its downward course, is 17 degrees from the horizontal; that said vein is a fissure vein; that there is a difference in the strikes or courses of said northerly and southerly dipping limbs of said vein of about 40 degrees; that at said places and throughout said distances, where said contra-dipping limbs of said vein are found to intersect and form a juncture, as aforesaid, there has been a mingling of the mineralizations of said two limbs of said vein within the angle beneath the juncture of the said two limbs; that at such places and throughout said distances the footwall of said two limbs of said vein, within the angle beneath their said juncture, by the process of replacement has been converted into mineralized quartz for considerable distances below said juncture, said replacement quartz extending from limb to limb."

Giving due effect to the finding, it is manifest that the vein in controversy is not a flat or horizontal vein or one

which would be practically horizontal but for a succession of rolls or waves in its elevation. On the contrary, it is shown to be a fissure vein with two dipping limbs whose course downward is substantial, regular and practically free from undulations. For 750 feet out of its total length of 1150 feet within the West End claim each limb is practically a separate vein with a distinct summit or terminal edge. For the remaining 400 feet the two limbs are united and from the point of union the mineralized quarts or rock continues upward for from 20 or 30 to more than 100 feet, and this seems to answer all the calls of a summit or terminal edge. In these circumstances we hardly would be warranted in saying as matter of law that the vein has no top or apex within the claim in the sense of the statute. See *Stewart Mining Co.* v. *Ontario Mining Co.*, 237 U. S. 350.

It is well to remember, as this court has indicated in other mining cases, that to take from the discoverer a portion of that which he has discovered and give it to one who may have been led to make an adjoining location by a knowledge of the discovery is unreasonable.

The contention is not that the top or apex of this vein has been found elsewhere, but only that what is found in the West End claim is not such in the sense of the statute. "The law," as has been truly said, "assumes that the lode has a top, or apex, and provides for the acquisition of title by location upon this apex." Probably this assumption could not be indulged where the fact appeared to be otherwise, but it serves to show that the absence of a top or apex ought not to be adjudged in the presence of such a finding as we have here.

Judgment affirmed.